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THE GREAT WALLED RIVER.*

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The Great Walled River is the most wonderful river in this wonderful world. Where is it? In some far country? In the heart of Equatorial Africa? In the Patagonian Wilderness? In the ice-locked regions of the far North? Not at all; but rising amongst the snowy ranges of our own magnificent West, and flowing its long course to the tropic seas entirely within our own domain. This river is only the Colorado of the West, the Rio Colorado Grande of the Spaniards; twenty years ago a mystery, a problem, a puzzle. For on its turbulent tide no man had ever voyaged far without meeting disaster or death, and the gifted imaginations of the frontiersmen supplied the unknown geography and marked the course and character of the mysterious river for more than a thousand miles to suit their fancy. The coloring was a little gaudy, but the reality falls not far short of the pictures of the early pioneers. The forbidding character and inaccessibility of

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this remarkable river are well attested by the fact that, although it was discovered by the Spaniards only fifty years after the landing of Columbus in the New World, it remained the great mystery of the continent for more than three centuries. And it is precisely the kind of a river we would expect the Spaniards of the sixteenth century—those enthusiastic, exaggerating, dare-devils—to discover, and throughout its course the Great Walled River is entirely in keeping with the romantic tales and marvellous exploits of that extraordinary period.

It is distinctly typical of those bygone days and deeds in its savage magnificence and in its mad, headlong plunge through the Rocky Mountains. Indeed, it seems almost out of place in our commercial country and our commercial time, and Commerce, thus far, has been unable to grasp it and put the modern yoke of utility upon the raging torrent which plunges, and roars, and dashes its angry foam high against the bounding walls, as if every rood of land and every drop of water was not in these days gauged by the standard of gold. It hurls defiance at the Almighty Dollar!

Niagara, the Yosemite, the Yellowstone, all in their turn have been lassoed by the speculator and coupled to the caravan of shows; but the Great Walled River rushes on in its primitive majesty, the sublime depths of its long chasms reverberating only to the ceaseless tumult of its own waters.

Yet its mysteries now stand revealed, and the long darkness has been dispelled, though the foot of the intruder and the keel of his daring boat passed years ago like the flight of an arrow, and left the river showing no trace of the invader, to continue unwatched, as before,

the fierce battle with the mighty walls. More than three centuries was required to mark upon the world's map the proper course and the true character of the great Colorado, but as early as 1541, Cárdenas, a captain sent by Coronado, a general of the Viceroy of New Spain, in search of a great river of which the natives had given some account, came to the brink of the Grand Cañon.

With what joy and satisfaction he must have peered into this unknown gorge, a wonder and a mystery in the new land of wonders and mysteries. The banks, no doubt, appeared to his astonished eyes just as he afterwards reported them, three or four leagues in the air, instead of the several thousand feet they actually are. Some of the party attempted to descend, but at last they came back unsuccessful, having accomplished only one third of the distance; far enough, however, for them to decide that the stream was a large one, and that rocks which from above appeared no larger than a man, were in reality higher than the Cathedral of Seville. About the same time another Spanish party entered the river from the Gulf of California and ascended a few miles in their boats, but the whole region was so formidable that little was determined. At the end of two centuries the river had been seen only in a few places throughout its long course of nearly 2,000 miles, and at the end of three centuries the white men who had looked upon it at a few points between the mouth of the Virgen and the Green River Ferry, where the Union Pacific Railway now crosses, could be counted.

In 1776, Father Escalante, with a band of Spanish priests on their way to civilize the Indians of the interior,

crossed at a point familiar to the Navajo Indians, which till nearly as late as 1870 was the only crossing available for white men in a distance of over 600 miles. It has always been known as "The Crossing of the Fathers." Another place called Lee's Ferry, 35 miles farther down, is now practicable, though not for fording, and the Mormons have still another crossing, somewhere above, near the mouth of the San Juan. In 1857, the government ordered Lieut. Joseph C. Ives, of the Army Engineer Corps, to have a proper boat constructed and determine for what distance the river was navigable above its mouth. The region had recently been acquired by the United States, and a military post, Fort Yuma, had been established seven years before, 150 miles above the gulf, to protect emigrants who were rushing to the gold fields of California. Lieut. Ives succeeded in exploring as far as the mouth of the Virgen River, and then abandoned further attempts to ascend. The last 25 or 30 miles had been accomplished with extreme labor and danger through Black Cañon, and the explorer wisely decided against any effort to penetrate farther. A land expedition was successful in revealing to the party the Grand Cañon at the mouth of Diamond Creek, a point a few miles above the foot of the gorge. Attention was then drawn away from this part of the country by the breaking out of the civil war; and it was not till 1867 that any thought was again bestowed upon the Great Walled River. In that year Maj. J. W. Powell, a soldier who had learned what hardship is, in the weary four years' struggle for the preservation of the nation's life, was pursuing his favorite study of geology in the "parks" of Colorado, and the accounts of the wonderful river which he received from

his hunters, fired him with the ambition to clear up the mystery—with an eager desire to determine positively whether, besides being hemmed in by mighty walls, the river flowed underground and over gigantic precipices, and was impassable, as the stories ran; or whether it was less extraordinary and would succumb to prudence and skill, as many other formidable things have had to do. At the battle of Shiloh he had lost a good right arm, but he believed, with the other, he could begin in Wyoming and trace the torrent to the point where Ives had left it. After long study of the country, he formed a plan and proceeded to carry it out. It was a costly experiment, and the funds at his disposal were limited; but finally, with four small boats manned by hunters and prospectors, he made an undaunted start from Green River Station, on the Union Pacific Railway. No adventure of the adventurous Spaniards was ever fraught with more uncertainty, more danger, more romance, than this first voyage of Major Powell's down the Great Walled River. Three months later, half-starved, half-naked, utterly worn out, minus four men and two boats, the little party reached the mouth of the Rio Virgen. One boat had been early wrecked in the Cañon of Lodore; one man lost courage and deserted at the first opportunity; and three, appalled by the appearance of a great rapid in the Grand Cañon (near the end of the journey it proved), abandoned their boat and the party, and scaled the 4,000 or 5,000 feet of walls, only to meet death at the hands of the savages dwelling on the plateau above.

Out of the ten men who started, six only, therefore, accomplished the wonderful voyage. These six were the first and the only human beings ever to pass entirely

through the Grand Cañon; though there is a story about a man named White, who, picked up about a year before near the mouth of the Rio Virgen, claimed he had made the passage on a raft. The man who picked him up and fed him assured me a year or two ago that he was satisfied that White told the truth, as he was bruised, ragged, famished, and wellnigh dead from exhaustion.

Though the expedition had cleared away the mystery, instruments had been lost or damaged, and the scientific data collected were of little value. In consequence of this Major Powell immediately invoked the aid of Congress for a second voyage, to enable him to thoroughly explore the remarkable stream and the region through which it had carved its way. An appropriation was granted; the work was placed under the direction of the Secretary of the Smithsonian Institution, and in the spring of 1871 the boats were launched on Green River, at the railway crossing. It was my good fortune to be a member of this expedition. Of the former party Major Powell himself was the only one, for this walled river offers even less inducement for a second acquaintance than for a first. One man who had been on the first was eagerly and confidently expected up to the last moment to join us, but somehow or other there was a great deal of snow about that time in the mountains where he was, and he could not get out. We all thought it strange an old mountaineer should find snow such an obstacle to his desires, but when we had been in the Grand Cañon a few days nothing was plainer than that being snowed in is sometimes a very convenient and happy kind of misfortune.

The boats were not peculiar except in being furnished

with three water-tight compartments each; that is, they were decked over, all but two spaces for the rowers, each of whom was to handle two oars. The steering was to be done by means of a very long, heavy oar at the stern, as a rudder is useless in such currents as are encountered on the Colorado. I must confess that the first time I saw these boats I felt a slight chill creep down my back; a premonition probably of the numerous cold baths I was to take as the bow oarsman of one of them. They looked as if they expected to go under water a good deal, and they certainly were not disappointed in their expectations. There were three of them, each twenty-two feet long, narrow in the beam, and quite deep for boats of their size. They were built in Chicago, of oak, as strong as was possible without making them too heavy for the crews to lift. The only railway across the continent at this time was the Union Pacific, finished a year or two before, and when we crossed the muddy Missouri on a ferryboat, and rolled out across the vast sea-like plains on the single, rudely-constructed track, we felt that we had indeed left the "States" behind, and were booked for two years in the wilderness. The month was April, and a light fall of snow added to the dreariness of the landscape, giving an extra forlorn appearance to the several tents and shanties which at that time constituted Green River City, where we arrived one morning very early. The party—eleven in all—was quartered in two vacant huts, and began immediately after breakfast to prepare for the voyage. The boats were hauled out on a convenient beach, and there given some finishing strokes to render them stauncher if possible, and better able to withstand the blows of rocks and

ponderous billows in the fearful tide that thunders against a thousand miles of giant walls carved through a lonely waste of mountains. However much we may find fault with civilization, it has some advantages, after all, over an untenanted wilderness. Even the puffing locomotives passing by; even the chattering Chinamen, seemed like friends to us now—or, at least, they did to me. And the dried-apple pies to be had at twenty-five cents apiece at the so-called restaurant! Well! they were, I assure you, luxury itself after a few days' struggle with Andy's biscuits; for, to say truth, our Andy had never cooked before he engaged himself in that capacity to our expedition, and he knew nothing about the proper combination of soda, cream of tartar, and flour to produce edible bread in the Dutch oven. Picture, then, the golden hue and extra solidity of the little balls he laid before us three times a day, accompanied by a frying-pan full of greasy bacon, and a huge kettle of coffee that had boiled for half an hour. Strange to say, however, the entire array vanished like frost before the morning sun. With constant practice Andy improved, and this, together with the sauce that hunger adds, caused a bowl of bean soup to eclipse, before long, even the dried-apple pie of Green River, and a slice of common bacon to surpass the rarest dish at Delmonico's. With the inner man thus strongly fortified by Andy's skill we were enabled in the course of two weeks to man the oars and pull out. The cargoes were all cased in rubber bags, and every thing was as it should be. Almost the entire population of the "city," excepting the Chinamen, turned out to see us off—there must have been at least fifteen men, women, and children. One

man, a deaf-mute who had been on the river above, took infinite delight in going through a pantomime performance to inform us that we were doomed to destruction; that we would be wrecked, and all attempts to climb the perpendicular walls would be fruitless; we would all drown. Nothing could stop his wild gesticulations, and they were the last thing we saw as we pushed off. Responding to the wild cheers of the assembled populace, we were swept down by the current, and a bend soon cut off our view of this last forlorn outpost of civilization with its warm-hearted pioneers.

It was a second descent to be sure, that we were undertaking, and we knew what to expect in the way of falls, wherein we had an advantage over the former party; but a second or a third voyage down this Walled River might fairly be likened to a second or a third attempt to jump safely from the Brooklyn Bridge. When Powell started the first time a man named Hook, who, I believe, enjoyed the distinction of having been first mayor of Cheyenne, asserted that if Major Powell could go down the river, he could go too, and he forthwith gathered a party, and, building some boats, followed in the wake of the explorers. Unfortunately, their boats were open and frail, and their zeal ran away with their prudence. Not far down, in Red Cañon, they came to grief. Poor Hook was drowned, and after digging a grave for him on a sandy bank, the remainder of the party made their way back on foot to their starting-place.

The fate of Hook gave further emphasis to the uncertainty of this kind of navigation, and we found material for reflection in the two facts that we had a long stretch of it to put behind us, and a difference of about 5,000 feet in altitude to overcome.

Green River Station is 6,000 feet above sea-level, the mouth of the Rio Virgen, our destination, is less than 1,000. There was no danger of losing the way, for that was carved literally through the bowels of the earth—through cañon after cañon, deep, rugged, and desolate. The Green River—the upper continuation of the Colorado, the difference in name being a mere accident—is not of a dangerous character at our starting-point; for it is there only a couple of hundred miles from its source; indeed, except at high water, it looks very tame and small. Rocky Mountain streams, however, are treacherous, and in a single night even a dry watercourse may transform itself into a mighty flood dealing destruction to every thing in its way. Neither did the river run here through a cañon, but a rough, barren country studded with high, rocky buttes which sometimes impinged on the shore. The current was swift with the spring flood when we started, and we were carried along at a rather uncomfortable and reckless speed, grating occasionally on shoals we could not avoid, and breaking an oar or two.

Our large supply of provisions, scientific and photographic instruments, guns, ammunition, tools, and baggage, brought the gunwales down to within three inches of the water. Of flour alone, there were 1,100 pounds, in 22 rubber sacks. To start thus well provided was necessary, for there would be no opportunity to add to our supplies any thing but chance game till we should reach the mouth of the Uinta River, some three months later, where arrangements had been made for additional rations to be brought in from an Indian agency forty miles up that stream. At three points we expected to replenish our larder in this manner. The snowy peaks of the Uinta

Mountains soon came into view, apparently barring the way, but we knew the river had met and conquered them, and had pierced the heart of the range. Passing the mouth of Black's Fork on the right, the valley became wider than usual and the course of the river was very tortuous for a number of miles, but on the fifth day it suddenly straightened out and made directly for a precipitous ridge about a thousand feet high, that extended far in both directions across the country. At the foot of this barrier the river seemed to vanish, for there was no appearance either to right or to left, of its continuation; and there was no apparent opening for it through the ridge, but a cliff of bright red rocks, rearing itself to the westward of a depression, and gleaming in the sunlight above the more modest hues like an enormous flame, was pointed out as the top of Flaming Gorge, the beginning of the extraordinary walls, that with the exception of a few breaks, or rather expansions, lock the river in for more than a thousand miles and find no parallel in the known world. Suddenly at the foot of the ridge, a short distance below the mouth of Henry's Fork, a small stream coming in on the right, the river doubled to the left, and we found ourselves between two low cliffs; the next moment it doubled to the right and we shot into the beautiful cañon, the brilliant rocks looming a thousand feet above our heads.

A grove of fine cottonwood trees, on the left side, added their rich green to the landscape, suggesting a camp, and as we looked we discovered the other boats, which had preceded us a few hours, swinging at their lines on the glassy surface of the water, while a film of blue smoke, rising and wasting itself on the gusty air,

completed the picture and told that Andy had laid down the oars only to take up the frying-pan. A patient man was Andy. As he himself remarked, he did not know much about our "bomometers," "threeoddlights," and "blank science business," but I can testify that he never shirked the smallest duty, and that is a record to be proud of.

From this camp we set out again on the smooth, swift water, expecting a rapid at every bend, but it was not till the river had turned sharply to the left and entered a more closely walled cañon that we came upon the enemy. It was a small specimen, passed in a moment, but I believe we began our enumeration of rapids with it, and it is distinguished by being the first of the six hundred, great and small, we scored on the journey. The left side of Flaming Gorge had not been vertical, but the cañon we were now in had a perpendicular wall about a thousand feet high on the right, the base of which we could have touched as we sailed along, while that on the left, though somewhat higher, was ragged and receding. The highest point in this cañon is 1,600 feet. Not a sign of life, except a few birds, was to be seen, though in this respect it did not differ from all the other cañons; indeed, farther down they are deserted even by the birds. A solemn stillness prevailed, disturbed only by the receding murmur of the little rapid. This cañon, called Horseshoe—a most unusual name, I wish to remark,—from the great bend the river here makes, was not long, and by dinner-time a lowering of the cliffs and a breaking or expanding announced the end of it. A little farther on another narrowing of the rocks made a third gorge with walls from a thousand to fifteen hundred

feet high. It was a beautiful cañon. From the large number of kingfishers flying about, the name of these birds was applied to it. At one place there were so many fluttering about the rocks that they suggested bees around a hive; and it was called Beehive Point. No obstacle to easy progress was encountered; there was nothing to mar our enjoyment of the magnificent surroundings. If the whole river, we began to think, is like this, our journey will be nothing but a pleasure-trip; and that night as we sat by the camp-fire, under some cotton-woods, where another widening of the rocks ended Kingfisher Cañon, we talked about what we would do when we reached the mouth of the Rio Virgen, till the Major smiled at our sanguine plans and said: "Wait till you see the end of the Grand Cañon." A short distance farther down the walls ran close together again, closer than in any of the three small cañons above, and the river disappeared entirely from view. It was the beginning of Red Cañon, so called from the color of the sandstone walls, which continue unbroken for twenty-five miles. A sullen roar was borne up to us from out of the dark gorge, and I climbed as far as I could up the steep slope back of camp, with the hope of catching a glimpse of the rapids that promised to soon entertain us, but I could not see them; nothing but rocks met my sight. For two days we listened to the ominous roaring while accomplishing necessary work, and then, on a bright Friday morning, with every thing as tight and fast about the boats as it could be made, and our rubber life-preservers inflated and ready for service, we pulled out into the river, heading for the mysterious narrows. Quickly the red walls shot up on each side, and a wild scene opened before us. The

channel of the river was thickly studded with rocks, amongst which the fast descending water plunged and beat itself into one great sheet of foam—a river run mad. Headlong the boats dashed into the seething mass, rising and falling with fearful violence on the huge waves. Hither and thither we were swept, dodging rocks as best we could, avoiding the walls, and speeding down with tremendous velocity. Glancing back for a moment we saw our second boat getting into serious trouble, but we were powerless to render assistance. As we cleared the worst of it we were hurled so close to the foot of the right-hand wall that one of our rowlocks was torn off. At the same instant a last glimpse was obtained of the second boat as she capsized and struck heavily on a mass of rocks that reared itself above the boiling surface. I laid all my strength on my oars to gain a sandy beach that fortunately came into view on the left, but with so heavy a boat one pair of oars made poor headway, and we were hurried down sideways so fast we thought the landing would fail. At length, however, the boat struck bottom a dozen yards from shore, and we jumped into the water, succeeding after a short struggle in arresting progress and reaching the beach. At the same instant the third boat shot like an arrow alongside. No. 2 was reported still upside down on the rocks, but with the crew working hard to get her off. Nothing could be done by us, so we waited. In about three quarters of an hour the unlucky boat hove in sight, and came in to us. Except a bad pounding and a crushed plank she was staunch as ever, while the crew were in the best of spirits, and made haste to claim the glory of the first capsize. Then we proceeded, running rapids or making “let-

downs"—that is lowering the boats by lines without unloading. Our clothing was usually saturated the whole day, and we were always glad to get into camp and change to dry clothes from our rubber sacks, throwing the wet upon a rock, to be resumed in the morning.

The walls of Red Cañon are extremely precipitous, but not rising vertically, in many places, from the water; masses of talus and alluvium with trees and shrubs intervening. They are generally about 1,500 feet high, but at one point they rise to 2,500. One Sunday we passed the place where Hook was drowned, and paused to glance at the rude pine board, inscribed with his name, and stuck in the sand at his grave. Here the unfortunate man had found his last resting-place; in the grand solitude rarely disturbed by human beings—a whole splendid cañon for his tomb. The disaster to Hook recalls a story of an Indian who attempted to run through this cañon. It was related by one of the tribe in the following language: "Rocks-he-a-p, h-e-a-p high; water go hoo-woogh, hoo-woogh; water-pony (boat) heap buck; water catch-um; no see um Injun any more, no see um squaw any more, no see um pappoose any more."

At one place the name "Ashley," with an illegible date below it, was found written in large characters on a rock beside a sharp rapid, and the rapid was called Ashley's Falls. Ashley, it is said, was one of a party that made an effort to descend the river many years before. Their boat was wrecked in the cañon not far below their starting-point (Brown's Park), and some of them were drowned; the remainder struggling across the country to Salt Lake City.

From Ashley's Falls the river made a rapid descent,

running like a mountain brook, and often filling the boats with water. The walls continued to rise till they reached 2,500 feet, when they began to drop down again, and finally growing less and less towering in their proportions they receded from the river, and we emerged into a valley, called Brown's Park, where for thirty-five miles there was comparatively open country. We had now descended 588 feet in less than a hundred miles; in fact, the most of this descent had taken place in the twenty-five miles of Red Cañon, where the river probably falls about 16 feet to the mile. Sixteen feet does not seem much when scattered over a mile, but if you will remember that it is not a regular descent, and that, at times, the drop of a whole mile is concentrated within a few rods, you will understand something of the nature of the Green River in Red Cañon. In Brown's Park the current was sluggish; and though two very small, pretty cañons intervened, it required constant pulling at the oars to get the boats along; a dull process after one has been carried for miles like a feather before a gale.

But this did not last long—only a day or two,—and then, looking ahead, we could plainly distinguish the huge cut—a sharply defined opening in the side of the lofty mountains; not like a gap with the sky beyond, but like the doorway into a house—a huge doorway:—the Gate of Lodore. One fair evening found us in camp on the very threshold. The river narrows and vanishes from the sight through the most magnificent portal in the world; the barren red rocks lifting themselves two thousand five hundred feet straight into the sky.

On Saturday, the 17th of June, immediately after dinner, the boats were carefully packed, a camp-kettle being

left in each standing-room for bailing purposes, the life-preservers were inflated and placed in the most convenient places, and we started.

How glorious, how sublime was the scene ! The calm air was unbroken by the slightest sound of falling water, or the faintest indication of the "mighty uproar" toward which we were advancing, and the subtle river, deep and swift and smooth, hurried us into the majestic depths, and silently closed the giant gates of rock behind. In this cañon a boat had been lost on the former voyage, and not desiring to repeat that experience, we proceeded with great caution. A distant murmur soon fell on our listening ears, announcing the approach of the first encounter. In about fifteen minutes the rapid came in view, and we were relieved to find it free from rocks and easy to run. Several then followed in quick succession, but so clean was the descent that the boats shot down like toys in a little brook, and we had time to look around. A symmetrical promontory so impressed the Major with its resemblance to a great wheat stack, that that name was affixed to it. We began to delude ourselves with the idea that Lodore was not such a terrible place as we had supposed, when another louder, angrier roar, with a ring to it that spoke emphatically of trouble ahead, broke the receding murmurs of the last. A landing was effected close to the head of the descent, which proved no greater than some of the preceding, but was full of large rocks, showing in an ugly way through the foam. The water above was comparatively quiet, and when we started again we pulled up stream some distance before attempting to get into the middle of the river.

Another minute, and we were flying through the rocks

and foam at railway speed. The boat rolled, and tossed, and pitched, while the water swept over us in a deluge, but we were at the foot almost before we knew it. The tremendous velocity of the river at one of these descents causes it to roll up in waves larger or smaller, according to the amount and nature of the fall. The same action may be observed in any brook with a rapid descent. These waves are not like sea-waves. In the latter it is the form which moves, while in river-waves the form is almost stationary and the water moves.

Given, then, a great volume of water rushing down a steep incline, we have a long "tail" of waves diminishing in size toward the lower end. A craft once launched on such a tide knows no stopping till quieter water is reached. The walls, continuing unbroken, grew gradually higher, the upper portion being generally almost perpendicular. The color was a rich brown, and the rocks were mostly sandstone. In considering these cañons carved thus through the mountains, it must be borne in mind that they are not the result of volcanic action, or of earthquakes, as some have supposed, but they are the result of the action of a river on mountains as they were forming; that is, the river is *older* than the mountains, and as the upheavals and folds producing them took place, the river cut them down, the storms of ages wore them away and sawed a channel through them.

As we were being carried along with reckless speed one day, we saw, only a few hundred yards below, a most forbidding fall. No fair view of it was to be had from the boat as she sped on, and the eddies and counter-currents which we generally took advantage of in making a landing in such a place, were absent. The whole mass

of the river bore down upon the place with an eagerness to get over it that was unpleasant. Somehow or other we must land, for to take the rapid blindly would never do. The Major ordered an attempt to be made to reach the right bank, where there was, fortunately, a footing. We laid on our oars till, stiff as they were, they bent like reeds, and we feared each fresh stroke would snap them.

We almost reached the shore; it was less than a boat's length away; but the fury of the river was sending us fast broadside on down to the rocks, now very near, where the water boomed and thundered. The oars were powerless; the current ran faster than we could move them. There was but one chance. The water near the bank did not appear deep; we could jump out and stop the boat, if possible, by bracing ourselves against the rocky bottom. We must stop at once. We could almost touch the bank. We jumped. The water was up to our waists, but so fierce was the current that our united efforts failed to prevent our being dragged a yard or two, and a yard or two at such a time seems a great distance. Every muscle was strained. The boat paused; it yielded—another second and we had her fast to the shore. Scarcely was this accomplished, when the second boat came flying down. As we looked, it seemed impossible to stop her. We rushed into the water as far as we dared, and caught her as she came in, and clung to her with all the strength we possessed. As soon as she yielded and was safe, the third boat was approaching with equal speed. Again we made the plunge, and as our number was increased, we were easily successful. Then we had dinner. Meanwhile a survey was made of

the rapid, and the feasibility of running it having been determined, we packed up and dashed through it like a whirlwind. A number of smaller ones during the afternoon of this day gave us no trouble, but near evening we came to a place where the river dropped into a "sag," and then fell over two very bad rapids close together. The dangerous sag was observed in time to avoid it by hugging the left shore as closely as possible. Once enter this sag, and no human power can save a boat from the great plunge below, for the water is swift and like a shallow bowl, a quarter of a mile long. Rounding a low point, we saw with relief a broad, smooth bay, across whose quiet waters we pulled slowly in the deepening shades of approaching night, the western wall rearing its gloomy face sharply against the mellow sky, while the loud roaring of the river at its base added to the impressiveness of the scene. Nothing could be more striking in contrast than the delicate colors of a fading sunset, seen only in the zenith, and the dark shadows filling the deep chasm and fairly quivering with the reverberations of the tortured river. Disaster Falls this place was named, because it was here a boat was wrecked on the first voyage. At the head of the first plunge we camped. It required a day and a half of hard work to get below the two rapids. At the head of the second, on a high rock, a hundred-pound sack of flour, that had been rescued from the wreck nearly two years before, still rested intact. It was cut open, and Andy made our dinner biscuits from it. So far as I could tell, the long exposure had not injured it, but as we had all we could carry, it was left where we found it, and where doubtless it lies to this day. Below the second fall, the remains of some cooking uten-

sils were found, supposed to have belonged to the Ashley party, which was probably wrecked here. Rapid now followed rapid, and the walls rose higher every day till Dunn's Cliff, looming up 2,700 feet, was reached. Triplet Falls, Hell's Half Mile, and dozens of other rapids were successfully passed. We were getting on famously. Sometimes at night we camped where the roar of water was deafening, and we could only converse by shouting at the top of our lungs. Scarcely for a moment were we out of sound of the roar of water.

In these upper cañons pine trees grow in many places down the ravines and cliffs to the water's edge, lending additional beauty to the view; but in the lower gorges the walls are bleak and barren of verdure. One reason for this is that, in the West, pine trees grow only at certain altitudes, and as the river descends toward the sea the tall pine is seen higher and higher above the stream, while the piñon and scraggy cedar take its place. Finally even these disappear, leaving the rocks destitute of vegetation, with the exception of cactus, yucca, or an occasional mesquite growing in a crevice. The Cañon of Lodore, taken all in all, is perhaps the finest in the whole long line, its walls rising to magnificent heights; its rapids reckless, roaring plunges; and possessing the charm of forest trees here and there.

At last we neared the end of the wonderful cañon, and we were not sorry. The constant tumult, and noise of water, the pitching and tumbling and carrying of boats and provisions grew wearisome; we desired a change for at least an interval; and one day about seven o'clock, as the narrow sky was growing tender and the night-gloom was once more settling down upon us in

the gorge, the sound of the last rapid we had run grew fainter; the river ran smoothly; a silence fell about us that seemed deathly; the walls dropped to no more than 600 feet at the river, and widened to such an extent that a few acres of low ground came into view on the left, and we found ourselves in Echo Park. A large river, the Yampa, came in from the east. We ran up the quiet mouth of it several hundred yards and camped on its right bank. Lodore was behind us. Our altitude was now only 5,080 feet, showing that the descent for the twenty miles through Lodore was about 420 feet, or over twenty feet to the mile. The perpendicular cliff on the right returned an unusually fine echo, and from this the place was called Echo Park. As the Yampa enters the park through a long deep cañon, there was no fear of disturbance of any kind, and we sank upon our blankets to enjoy the tranquillity of the night. There are but four ways of entrance into this park. One down the Green, the way we came; one up the Green; one down the cañon of the Yampa; and the other by an Indian trail, through a small lateral cañon. A more secluded place would be hard to find.

Hillers tried his hand at fishing, meeting with better success than anywhere above, for he caught two large sluggish fish, one four feet long. We called them salmon-trout.

A short pause was made here while a party ascended the Yampa a few miles, and then our journey was continued. Following along the base of the Echo Rock, we presently turned sharply to the right, passed around the end of it, and entered Whirlpool Cañon, so named because of numerous whirlpools encountered there by the first ex-

pedition. The Echo Rock was now seen to be but a tongue of homogeneous sandstone, 600 feet high, as many hundred yards thick at the thickest part, and about a mile long. In a short time we were directly opposite our starting-point, and not far from it in a straight line, but with the sandstone wall between.

Then up rose the rocks again, forming high walls that came closer together than at any preceding place. Our ears were on the alert for the familiar sound of falling water, but for a long time we sailed on without encountering any obstacle. The splendid many-colored walls, carved and terraced by the storms of countless centuries, towered above till the strip of deep blue sky seemed to rest upon them like a painted ceiling; it was like the nave of some gigantic cathedral, with a piece of heaven itself for a roof. Suddenly the dull roar of a rapid sounded ahead, and it was not long before the swift current took us down to it. A violent rocky place it was, where the river was torn to white tatters, but at length we were below it, going on with the stream now running like a mill-race. The walls widened and grew broken and irregular, but reaching the height of 2,400 feet before they showed signs of breaking away. In two or three days we had accomplished the fourteen miles of Whirlpool, and the walls were replaced by beautiful rainbow-colored hills. The descent from Echo Park had been only 80 feet, and this had occurred principally in three or four places. The river now availed itself of the release from bondage, and played hide-and-seek with numerous small islands that bore groves of cottonwoods. The channels were so shallow, at times, that our keels grated on the gravel; but we soon left the islands

behind and the water became deep again, though sluggish and black. It seemed to be tired.

Moving the heavy boats was no light work, and we proceeded lazily, longing for swift water, and admiring the wide expanse of sky and the wonderful coloring of the surrounding hills. This was Island Park. Before sunset the winding river brought us to the jaws of another cañon—another grim gateway into a mountain. The next day some of us were sent to the top of this gate on the opposite side. It was a hard climb, for the summit was 3,000 feet above camp, but the view that spread out beneath was worth climbing a week to behold. Far, far below, the gleaming river wound its tortuous course from the mouth of Whirlpool Cañon, through Island Park, till directly under us it cut into the rocks again, where it was visible to us for several miles, churning its way along between the two precipices. I wish I could convey an adequate impression of the vastness and magnificence of this view, but the pen and the tongue are powerless before the task; indeed it is surprising that the eye itself is not stunned by the immensity of the panorama from such a height, in such a country, and it is, for me, difficult to decide where the greatest wonder lies;—in the glory and grandeur of the scene, or in that subtle power that takes it in, and sets the picture clearly before us, color for color, shadow for shadow, the counterpart of nature.

Early one Sunday morning we left the Island Park camp, pushed into the middle of the river, and glided down with an easy dipping of the oars toward the yawning gorge that would lead us into the next cañon, the eighth of the series. The current was smooth, and in a

few minutes the massive layers of stone, one against another, regular and compact as in a veritable artificial wall, sprang out of the water on both sides, gradually curving over to the horizontal and breaking into a thousand—aye, ten thousand thousand—craggs, as they grew higher. It was the beginning of a gash 8 miles long and 2,500 to 2,700 feet deep, through a great upheaval; the beginning of Split Mountain Cañon, so named because the river has here actually split a mountain in twain by the constant dashing of its waters. As the mountain was pushed up by the subterranean forces, so the river cut into it, sawing it apart from end to end. A raindrop is an apparently insignificant thing, but, in reality, it is a ceaseless and mighty destroyer, a wonderful sculptor, playing with this world of ours as children play with sand; carving, moulding, and sweeping away. Here it had cut a mountain in two, and chiselled the rocks into a multitude of minarets and spires, only to throw them down, grind them into powder, and dash them hundreds of miles away into the sea.

Three days of saturation and bumping amongst the boulders and foam brought us to where the strata came solidly together again and began to descend. Presently they curved gracefully over and disappeared under the water, exactly as they had come out of it 8 miles above. A broad valley now opened before us—the Wonzits or Antelope Valley,—and we might be on the look-out for Uinta and White River Utes. The valley is about 80 miles long, with broad stretches of alluvial soil, and large groves of cottonwoods here and there along the river. The comparatively level ground sometimes extended back for several miles, meeting the foothills of the

bounding mountains. The men soon sighed for rapids, for the current was gentle, and the boats pulled hard.

Opposite the mouth of the Uinta River we made a camp to wait for the arrival of supplies from the agency, forty miles away. We had been for a week or two entirely without soap, and when the supplies came, the first thing the men did was to seize a box of laundry soap, break it open, and rush to the river, each bearing a cake of it. To this day, common laundry soap is fragrant to me because of the association with that delightful hour. An Indian runner brought the information that the Mormons who had been charged with the duty of meeting us at the next appointed station with more supplies, had been unable to make their way through the unknown and terrible country to the designated point, the mouth of Fremont River, and were obliged to give up and beat a retreat. As one of our party afterwards remarked when in the same region: "No animal without wings can travel there."

Our plans were somewhat altered by this failure to reach the mouth of the Fremont (or Dirty Devil, as it was first called), and Major Powell left us for Salt Lake City, about two hundred miles distant, from which place he would rejoin us in a valley a hundred miles farther down, bringing rations enough with him to tide us over to the third supply station, the Crossing of the Fathers. As soon as our new supplies were properly sacked, the oars were resumed, and we set out on a comparatively sluggish current for the Cañon of Desolation, twenty miles away.

Our clothes by this time were tattered and torn; and our shoes were more than half worn out. Getting into

the water so often was very hard on them. From a Ute Indian Hillers had learned to make moccasins with raw-hide soles, and he manufactured a pair for each man in his spare hours. These we could use for walking and climbing in dry weather. Before we arrived at winter quarters we were a spectacle to behold. Nothing but overalls, shredded to the knee, shrunken undershirts that clung to us like gloves, and shoes patched and nailed together in every conceivable way, was left to us. Some miners said we were the most dilapidated specimens of mankind they had ever seen.

About 250 miles of the journey were behind and we had descended altogether a little over 1,400 feet (1,418), 330 of which had taken place since leaving Island Park. The stream was now, in some places, nearly a mile wide, and swarmed with beaver, which we often used as targets. Presently walls again rose up by the river, but the transformation from the valley was so gradual that we were deep in the solitudes of Desolation before we fairly realized it. Unlike the cañons above, this one had no trees of any consequence in it, either in the crevices or on the terraces, but the rocks were almost barren for a great height. Along the edge of the water there were a few cottonwoods and box-elders. By the fourth day the cliffs were 2,000 feet high. The water had fallen considerably now, and the boats were often severely pounded on the rocks; several times they were so crushed that we were obliged to halt and wield the saw and hammer for an hour or two. Two or three trips were made up favorable gulches to the pine timber to collect gum enough to caulk the boats. Rapid followed rapid in quick succession, and while none of them were re-

markable, they gave us an abundance of hard work. Opposite one of our camps, a detached portion of the wall stood out so boldly that it was named Lighthouse Rock.

The heavy rapid where a boat was swamped on the first trip was passed, by letting the boats down by line, but we saw nothing of the guns, chronometers, etc., which had been lost then.

For 97 miles we wrestled with the river in this Cañon of Desolation, and then passed through a slight break into another very similar, 36 miles long and 2,000 feet deep. At the foot of this we were to wait, according to orders, a certain time for the return of Major Powell, and if he did not come we were to proceed and get through as best we could on what rations still remained. Our camp was at the beginning of another irregularity and expansion of the walls, called Gunnison Valley, after Captain Gunnison, who crossed here in 1853. It is 27 miles long, full of cliffs and barren rocks. The descent of the river from the mouth of the Uinta to this camp near Gunnison's Crossing, is 587 feet. Not far from us were the Azure Cliffs, extending a long distance, beautifully carved into alcoves and buttresses, and as blue as an April sky. About the time appointed our leader came, bringing with him enough rations to keep the wolf from the boats till we could reach the Crossing of the Fathers. When the men who came with him had turned to retrace their steps through the wilderness of cliffs, we launched forth once more. The valley was extremely picturesque with its peculiarly eroded buttresses and cliffs of various colors from azure to chocolate and white. One unique structure, chocolate in color, beautifully carved by the

rains of ages, especially attracted our attention because of its symmetry. It was about 400 feet high, composed almost wholly of gypsum, and was named Dellenbaugh's Butte. The mouth of the San Rafael River was just below on the right, and there we camped. The ground was strewn with chips of chalcedony, obsidian, jasper, and like stone, besides fragments of and whole well-turned arrow-heads. This had been some arrow-maker's resort, and numerous fine specimens were found of the native skill. A singular and beautiful feature of this region was observed on leaving this camp. Vertical walls of sandstone some 50 or 100 feet high bound the river in, and a heavy rain collecting on the rocky, soil-less surface of the country, rushed down every ravine and gulley, leaping to the river from the cliffs in graceful cascades, which could be counted by dozens. We were now in Labyrinth Cañon. The walls ran up till at our first night's camp they had reached their maximum of 1,300 feet. The river was smooth, running swiftly but without commotion. Opposite our camp one of the most beautiful of all the rain cascades was visible, plunging over the straight cliff and vanishing in spray, to be collected on a projecting ledge and shot out again to the river. Our course was now very winding. At one place we pulled about 6 miles, and at the end were within 400 yards of our starting-point, a high wall intervening. This was called Bowknot Bend. On this dividing wall the photographer had been left at work, and when we stopped for dinner he came down to us. A day or two more, and the walls for a short distance lost their regularity, breaking into thousands of splendid columns and buttes of many

colors, and ending the 62 miles called Labyrinth. The whole country was composed of rocks apparently on end. There was no soil or vegetation worth mentioning. It is the Land of Standing Rocks. Various forms were discerned in these standing rocks as we saw them from different points, perhaps the most beautiful being that which was called the Butte of the Cross. It is in reality two buttes, one behind the other. The river still runs smoothly, and one would suppose that its wild race is over; but no, it is only preparing for the greater turmoil and trouble soon to come. We pulled along with the easy-flowing current, around this bend and that bend, everywhere having new views of the many buttes and pinnacles, till we described a beautiful curve and paused at the beginning of Stillwater Cañon. The last bend was named Bonita Bend at the suggestion of the photographer. The walls immediately began to rise as we left Bonita Bend, and for 42 miles the river was more closely bound than anywhere above. So straight were the rocks that the first night it was difficult to find a camping ground, and we drifted on between walls rising vertically from the water. The current was swift, but there were fortunately no rapids. It was almost dark before we reached a narrow strip of alluvium on the right, which offered a friendly footing and a few sticks of driftwood for a fire. The next day some ruins of stone dwellings were discovered on a projecting cliff near an alcove, the bottom of which contained soil enough to grow corn after the Moki fashion. Strange as it may seem, people had dwelt and died in this wild and almost inaccessible spot, so long ago that there is no record of them. The trunks of trees laid up against the ledges of

the cliff here and there had enabled the denizens of this secluded retreat to climb to the plateau 1,000 feet above.

Running from these ruins for about seven miles between the vertical walls on a swift, smooth current, we came suddenly to the mouth of a large cañon on the left. It was the cañon of Grand River, which here joins the Green to form the Colorado; or, as the Green is only a continuation of the Colorado, perhaps it would be better to say the Grand here runs into the Colorado. There is no break in the continuity of the walls which rise all round 1,300 feet, barren, forbidding, desolate. Two or three hackberry trees grow on scanty strips of sand at the base of the walls, but aside from them there is no vegetation. We succeeded in climbing out by a narrow gulch, and were well repaid for our trouble by the extraordinary view from above; a strange, weird view; a vast desert of barren rock; a bewildering land of spires and pinnacles, crags, crevices, and gorges. There was no earth—nothing but naked rock—and the eye returned wearied to find relief in the turbid flood, which, far below, rushed into the growing depths of Cataract Cañon. Look from any high building in New York across the city; imagine the houses a thousand feet high and every chimney and smokestack a high pinnacle of rock, the whole extending farther than your vision, and you will have some idea of the appearance of the country at the junction of the Grand and Green. When you are up you don't know where you are, and when you are down you are nowhere.

The volume of the river was largely increased by the addition of the water of the Grand, and the descent became immediately exceedingly sharp. Large rapids

abounded, and it was from their violent character that the cañon received the name of Cataract. The walls were soon 2,500 feet high and almost unscalable. We were wet, as usual, the whole day long from head to foot, and as it was now the end of September, the water was decidedly cold. The huge waves swept from end to end of our boats in every rapid. The sun shone into the gorge for only a few hours in the middle of the day, always disappearing about three o'clock, and in the cold shades our teeth rattled and our lips turned blue. With each mile of advance the scenery grew more and more magnificent; more and more terrible. The massive walls rose to 2,700 feet of perpendicular height; at some places, indeed, they overhung. One afternoon, when we had been resting on a broad beach and had concluded that it was the intention of the Major to pass the night at the place, he returned from a climb and gave orders to pack up for an immediate start. A hasty supper was swallowed, and about five o'clock we shoved out into the stream. The chasm was already darkening, and the prospect ahead appeared tenfold more forbidding than it would have seemed in daylight. One of our number hinted that we would have some lively work before we slept that night, but as we had been having lively work for some time we did not regard this as out of the ordinary. The walls, which had spread out a little, quickly narrowed up, and at the water's edge the rocks were straight and smooth on both sides. Presently a small rapid came in view. The current ran faster. We dashed through the little rapid, and the cold spray drenched me. Then the river whirled along amongst some huge boulders that towered like pinnacles out of

the water; probably they had fallen from the cliffs overhead. The current grew very swift. Just below we could see the river separate at a half submerged, rocky island and break in wild plunges against the cliffs. One glance showed that it was an ugly place, and that there was only one chance. That chance was to keep in the dividing line of the waters and effect a landing at the head of the little island. We succeeded in doing this, and then the question was how to get off, for the right-hand portion swung to the left across the foot of the island, and, joining the other, broke against the base of the left wall. While we were considering a method of procedure the clouds, drifting across the narrow opening far above, turned to gold, and in a few minutes night began to fall in earnest, thickening the gloom and showing us that if we would have fire and a dry bed no time was to be lost. Then as hastily as we could we dragged the boats down the right bank of the island till we were below the fall, and there we embarked and pulled out into the waves and current with all our might to reach the other side before we could be swept against the left wall below. It required hard pulling, but we passed nevertheless so close to the cliff that we could not use the oars on that side. But nothing was damaged, and we went on in the darkness till the sound of more falling water warned us to seek the first opportunity to go into camp for the night.

On the 29th of September we finished the 41 miles of Cataract Cañon and entered a new one, very narrow, and called Narrow from that fact. It was only 9 miles long and about 1,300 feet deep, with no difficulties. It was very straight, and we could soon see out of the end of it,

where Glen Cañon began, with what we then called the Unknown Mountains in the distance.*

At the foot of Narrow Cañon we came to the mouth of Fremont River and the beginning of what we called then Mound Cañon, but which has since been consolidated with another called Monument to form Glen, a fine cañon, 149 miles long, with generally smooth walls from 200 or 300 to 1,600 feet high. There is only one rapid of any consequence in this whole 149 miles at high water, and that is easily run, while at low water a number of shoals and diminutive rapids appear in the various channels the river takes amongst the exposed bars. The walls are often more than perpendicular and perfectly smooth, without a perceptible seam or fissure in the entire height of a 1,000 feet or more, and beautifully decorated by iron stains.

On the 6th of October we had eaten the last morsel for dinner, including some queer fish Hillers had caught, and were pulling briskly along wondering where the next would come from, when we heard a shot ahead, and presently saw a white rag dangling from a pole on the right bank. We were below the mouth of the San Juan, were nearing the Crossing of the Fathers in fact. The walls had dropped to several hundred feet, and it was doubtless possible to reach the river from the surrounding country at several points, so we kept a sharp

* These Unknown Mountains were peaks composing a short, high, nameless range that had never been visited by white men. They are now honored by bearing the name of the late Professor Henry. Mr. G. K. Gilbert, in his "Geology of the Henry Mountains," has explained the peculiar geological structure of these peaks; a structure which is so peculiar that when the first descriptions came in the geologists were puzzled, and it was not till Mr. Gilbert had spent several months in the region that the peculiarities were fully explained.

look-out, expecting to meet the men with our supplies. We hoped the shot and the rag might mean the realization of our hopes, and, on landing, the first thing that greeted our eyes was a pile of well-filled sacks. Just below was the Crossing of the Fathers. Thirty-five miles farther down, at the mouth of the Paria, we left our boats for the winter, as the water was too cold to proceed, and we would consequently carry on topographical work in the mountains to the north till the return of summer. This place is now called Lee's Ferry.

It was the middle of August the following year before we were ready to enter the greatest chasm on the face of the earth, the Grand Cañon of the Colorado, a mighty gorge nearly 300 miles long (283) and over a mile deep. The altitude of our starting-place is 3,170 feet above the sea. The altitude of the mouth of the Rio Virgen is less than 1,000. On the 17th, after shaking hands with our land party, some of whom looked as if they never expected to see us again, we pushed off and dropped down into the cañon. The walls are at first quite low—not more than 100 feet,—the walls of the last cañon (Glen) receding from the river and forming the Vermilion Cliffs, that extend in a sharp line for many miles like a huge wall, leaving the strata that run up from under them to begin the Grand Cañon. These strata run up rapidly, giving to the river the appearance of going down very fast toward the centre of the earth. We now had but two boats and seven men all told. One boat had been left behind because it was scarcely strong enough for the work, and because there was no one to man it, two men having been too ill to go on, and the third having been discharged. By dinner-time the first day we

had made five miles, with only two rapids, and one a small one, to trouble us. The walls had risen to 500 feet, and were composed of marble of various hues, except white, beautifully polished, at and near the water-level, by the action of the water, so often heavily charged with sand. As far as the mouth of the Little Colorado, a distance of about 65 miles, the walls are principally of marble, and that part has been named Marble Cañon; but inasmuch as there is no break in the whole 283 miles of this extraordinary chasm, I am inclined to consider it all one in name as well as in fact. To me the Grand Cañon begins at the foot of Glen, and ends at the Grand Wash, where the walls break away; and I can see no good reason for breaking it in two.

After dinner, we soon came to a fall of about 18 feet in 75 yards. The force of the current was terrific, for the spring flood, which had raised the river that year to unusual heights, had not more than half subsided. With each stage of water the river somewhat changes its character; at some places high water is the most favorable, at others low, though, as a rule, low water is preferable, because more opportunities are afforded for landing, and it is usually possible to guide the boats and keep them under control. It was at this rapid that a party of prospectors, who had broken open some of our hidden stores, a few months before had met with what might have been regarded as just punishment for their sins.

In their ignorant audacity they had constructed a large raft of logs, and expected to make the passage upon it. Ten in number, they started, but here the raft was demolished. By great good luck all the men succeeded in

reaching a mass of boulders at the mouth of a side cañon on the right, saving nothing but themselves. The walls were only 500 feet high, but they were so precipitous that the unfortunates made several attempts to reach the outer world before they succeeded, and then it was only by the aid of a ladder made of driftwood tied together. They will probably have more respect for the Grand Cañon, if they should ever try the passage again. Few are tempted in that direction, however. I received the other day a letter from a man in Arizona who was turning his attention that way, but some quotations from my diary of our trip caused him to refrain from any attempt at present.

We made a portage at the rapid, preferring to keep on the safe side when possible. An ounce of caution is worth several tons of foolhardiness. The next day, when we started again, we found that we were no longer on the threshold of the gorge. The walls loomed higher and more massive, if possible, as we went on, and there were rapids in abundance. At noon a stratum of soft sandstone was at the water, and it was with some difficulty that we found a place where we could stop to refresh the inner man with the customary bacon and coffee. At length a place was discovered on the left, where we could fasten the boats and climb up to a little flat place in the shadow of a projecting ledge. A glimpse could be had of a rapid not far below, and some of us climbed up to a terrace, through a crevice, to see if we could get a better view of it. How sullen it looked down there, a quarter of a mile away, plunging and leaping and glittering under the summer sun, as if poor frail humanity had no existence! We went through it easily, with the usual

experience, and longed for more to get behind us. The current was tremendous most of the time now, and the boats were carried along like straws in a mill-race. The walls, so steadily growing in height, kept up the impression we had of more rapid descent than we were actually making, and it was not difficult to picture, except for the quantity of water, a final exit into the realm of His Satanic Majesty, for whom we now felt obliged to entertain some respect. We almost seemed to be encroaching on his undesirable domain.

I once heard a story to the effect that, when the world was finished, a vast amount of material was left over, the disposal of which was a problem. Finally the Devil was summoned and presented with the refuse, to use as he should see fit. He wasted no time upon it, but tumbled it together in a heterogeneous mass, smiling with delight as he contemplated the close resemblance of what he had made to his own notorious country, and thought of the trouble it would give the children of men. But he was suddenly confronted with a serious difficulty; there was a large amount of water in the interior that must pass through his new land to the distant sea, and if it should be allowed to run as common rivers run, fertility and abundance and happiness would be established on its shores. He was in a quandary; but the Devil is persevering, and he is a capital engineer. He was not long—so the story goes—in devising a scheme that would have been worthy of a government contractor or the projector of the Panama Canal. He decided to cut a channel for the river from end to end of his realm, so deep, so wide, so inaccessible, that the worldlings would die of thirst within sight and sound of the roaring waters; and this

was the true origin of the Grand Cañon of the Colorado. It would not have surprised me to behold His Satanic Highness, sitting cross-legged on a boulder, leering at us. By the 19th the walls had increased to about 3,000 feet, and the cañon was truly sublime. Rapids were numerous and difficult. Each day there were ten or twelve, some of which we ran and some at which we made portages or let-downs. In the latter case, one man generally remained in the boat to fend her off the wall and rocks, and at the same time keep her bow so turned to shore that she could not "get the bulge" on us, as we then called it; in other words, should not get out across the current, and so either snap the line or pull the men into the river. Several times those at the line were dragged almost on their faces over the rocks, and it was only by exerting themselves to the utmost that the mastery was maintained. The walls were light red in color, stained by the disintegration of beds above containing iron, and in many places were eroded into galleries, and balconies, and alcoves, and Gothic-like cavities, that added wonderful variety and beauty.

Next to Lodore, this portion of the cañons is, in my opinion, the most beautiful.

There were one or two rapids to the mile, but they were often so free from rocks, that the boats dashed through like ducks, quivering under the deluge, but keeping right side up. Had our boats been poorly constructed, we would have been overwhelmed with disaster, but the builder was honest, and the model was good. They could not sink, it will be remembered, on account of the water-tight compartments, and the cargoes kept them steady, preventing capsizing; but adding several barrels

of water to our load brought them down till the gunwales were almost level with the surface of the river.

The walls continued to go up faster than the river went down, the cañon was not wide, and in places they seemed almost ready to join together overhead and exclude the daylight. Do not get the impression that these cañons are dark in the daytime, for they are no darker than the shady side of a street, and the sun shines into them more or less, according to the trend of the cañon and the season of the year. I have read of people who had been in cañons so deep and narrow that they could see stars in the sky above at noon. I have seen a good many cañons, but I never saw stars from any of them, except at night.

On the 22d of September the scenery assumed such gigantic proportions, the river ran with such fearful velocity, dropping in one sharp rapid after another in quick succession, that it was difficult to realize that we were still in the common world, and had not slipped unawares, in some extraordinary and unaccountable way, out of it to some undiscovered and tenantless planet. The cañon was wider; but even finer on account of the extra width, for we were able to appreciate the great height. How insignificant is man in such a place! At one time the mighty torrent appeared to be plunging down a continuous declivity, with sharp rapids here and there caused only by obstructing boulders—a wild race to the sea.

The water roared, and boomed, and seethed, and boiled, and tumbled, and dashed in frantic spray, fretting itself in a thousand mad writhings as it rushed down without a check. Sometimes we could barely control the boats. Once we were borne swiftly, irresistibly toward a place where a great surging and breaking indicated rocks near

the surface. It was impossible to avoid it; and the speed of our craft was such that a collision meant annihilation. There was nothing to be done but wait. We rested on our oars. On sped the boat. She plunged into the boiling mass, and went through it without a bump—the rocks were too deep to strike us. On we went without dipping an oar, except for guidance; on—on—on, down—down, ever descending with terrible velocity along with the furious flood, the din of the reverberating roars filling the cañon, fairly stunning the ear, and seeming to batter against the fair blue sky spanning from brink to brink, nearly 4,000 feet above.

Through an occasional side cañon we could catch a glimpse of cliffs farther back that would soon add 2,000 feet more to the already giant proportions of the chasm. To say it was magnificent but feebly expresses it. Toward evening one day the river seemed about to disappear under the great walls that loomed up before us at the end of a long straight stretch of river, gloomy and sombre at the bottom, but painted with fire at the top by the red sunset. At the end of this descent, we came suddenly upon the mouth of the Little Colorado or Flax River, and went into camp there. It had been a good day for us; in 18 miles we had run 18 rapids, one fully $2\frac{1}{2}$ miles long, between walls that for sublimity can have no equal on the globe. We had descended 480 feet in $65\frac{1}{2}$ miles; not so rapid a descent as in Lodore or even Red Cañon, but more formidable on account of the nature of the walls, the abruptness of the rapids, and the greater volume of water. We were still 2,690 feet above the sea.

The Little Colorado, an insignificant though lengthy

stream, entered through a close cañon 4,000 feet deep. This locality has figured for years in many a miner's yarn, because of its inaccessibility; and scores of men have known that mines of fabulous wealth existed here.

About five miles below the cañon widens and the walls rise tier on tier and terrace on terrace to over 5,000 feet. Masses of igneous rock protrude here from the bottom. This is an extremely interesting region geologically as well as geographically, and I refer those who would like to fully understand it, to the excellent work by Captain C. E. Dutton, on the "Tertiary History of the Grand Cañon."

This part of the cañon is several miles wide at the top, and were it not for the immense height and unbroken precipitous character of the walls, it could properly be called a valley. Two great hollows on the north that help to make this expansion are named respectively Nankun-to-wip and Kwagunt valleys, the names the Pai Utes living on the plateau have given to them.

The cañon, it must be borne in mind, is almost entirely without vegetation and animal life. At one place we passed a green spot on the right wall formed by a spring gushing out about 100 feet above the water and trickling down amongst masses of ferns, mosses, and other small plants, and in places the mesquite trees grew to some height amidst the rocks beside the river. The only animals we saw, besides a few small birds and several ravens, were two mountain sheep, drinking at the river in the widening of the cañon. They fled at sight of us, as if they too were merely explorers, and disappeared over the crest of some distant high rocks. From the brink above in this vicinity, the best extensive view of the chasm is to

be had. It is reached on the south from Flagstaff, Atlantic and Pacific Railway, and on the north from Kanab. The greatest depth is 6,300 feet.

The lower portion of the wall soon turned to granite (metamorphic crystalline schists), jutting out in innumerable buttresses, into the narrow river, and as this granite ran up the cañon assumed a sombre look, for the granite was very dark in color, almost black. It reached at length a height of about 1,000 feet, and generally shut out any view of the higher walls except at the bends. The character of the river changed with the change in the walls. There would sometimes be no perceptible descent for a long distance, the water running with a smooth current, when there would come a sudden plunge; not vertical but very abrupt. The landings were difficult, and there was often nothing but sharp rocks to camp on.

On the 29th, about dinner-time, we reached the ugliest looking place I ever saw. The first 1,000 feet were of granite, as in the last view. Landing-places were not frequent, and a deep roar far ahead, the cause of which we could not see, suggested a cautious advance and an early stop. A few broken rocks protruded from the water at the foot of the right wall, and pulling to them we made the boat fast. The roaring was now terrific, but, though the river disappeared from sight 100 yards below, we could not get a view of the trouble from our low position in the boats. As I stepped up on a large boulder I beheld a scene I hope never to see again under like circumstances. The hard black walls rose almost vertically on each side, rough and ragged, and for half a mile the descending torrent, compressed into narrow limits, was surging, and booming, and lashing

itself into a solid mass of boiling foam. There was no choice; we must take our chances and go through it.

Some bits of driftwood on the rocks furnished a small fire, and Andy got dinner as well as he could by it, while the rest of us made the boats snug and attended to other duties. A full stomach is a great encourager, and after our bacon and coffee the undertaking did not seem quite so formidable. The second boat was to remain where she was till we were fairly through, so that there would be no chance of collision, and that in the event of our meeting with the success we anticipated we would be in a position to render any necessary assistance to our companions.

When all was ready we pulled up stream, close to the wall, for about a quarter of a mile, the current being quite slack there, and then our bow was turned suddenly out, and we put ourselves as quickly as possible in the middle of the river. The roar grew louder, louder, nearer, nearer. I felt like glancing around to see how it looked, but every thing might depend on a single stroke of the oars, and I held mine ready to execute any order on the instant. We neared the brink of the descent. "Back water!" shouted the Major, and we backed water with all our strength to lighten the shock. Our speed began to accelerate. There was a sudden dropping, a sudden giving way of support, as if the world had been knocked out from under us, and the boat started like a wild locomotive at terrific speed down the incline. The water broke over us in floods. The terrible gorge was transformed into chaos. "Bail!" shouted the Major, "bail for your lives!" We plied the kettles as vigorously as we could in such a tossing shell, but for every

gallon thrown out, whole barrells swept us from end to end. The boat plunged, and rolled, and rocked, and twisted; sometimes just grazing a huge black rock seen through a canopy of foam. In less than a minute we were through and lying in an eddy below, bailing out and watching for the other boat. We saw her presently appear at the brink, and then she was lost to view amid the spray and foam, till she ran safely alongside. From below, the rapid had even a more forbidding appearance than from above. It looked like a vertical wall of foam, but then we looked at it with different eyes; there was no possibility of going up it. The descent here was probably not less than 60 feet. Some of the men called it the "Sockdologer."

Thus we proceeded through this sublime gorge, sometimes making successful runs, sometimes laboring a whole day to advance a few hundred yards. On one occasion we worked hard till one o'clock in the afternoon to gain 600 feet. Well do I remember this day. At one time I was sent in a boat to keep her steady, while the remainder of the party, at the end of 200 feet of rope, picked a precarious path along the face of the cliff 100 feet above. It was not a pleasant situation either way; they might be pulled off, and if they were I should have been compelled to navigate alone what we did not care to navigate together. It was discovered then that the boats were so badly bruised that repairs would be necessary before going on, so at a convenient pile of rocks they were hauled up and the saw and hammer brought out.

As the day declined the river was found to be rapidly rising and submerging the rocks on which we had been at work. Night was falling, and it was too late to go

on, but luckily there was a ledge about 20 feet above that we could reach, and to this we passed our supplies. The river continued to rise. The surging water crowded us back against the wall. The boats would be pounded to pieces if left here, so by means of ropes they were hoisted about 6 feet up the side of the cliff, and the lines made fast to crags above. By climbing from the ledge around a sharp projection, a wider place covered by broken rocks was discovered, and there we camped. A few half dead mesquite bushes afforded fuel for a sickly fire, over which Andy, the indefatigable, patient Andy, managed to bake bread for our supper. Every thing was wet, for there was rain at intervals. Just before dark the river began to rise faster; it came up four feet in one hour. We speculated on what was to be done if this should continue all night. The rocks were sharp under our blankets that night, but for my part I slept soundly; I could not help it; I believe I could have slept on a cactus bush. The morning broke gloomy, damp, heavy. As quickly as possible we ate breakfast, such as it was, and then lowered the boats. The water had fallen a little, but they bounced about impetuously, though a man in the river at each did his utmost to steady her. The footing was narrow. They were in danger of smashing. It was found that one still leaked badly; a stream as large as three fingers spurting into the middle cuddy. There was no time and no place for further repairs. We were half way through a heavy rapid, and would have to pull straight out into the river from here, notwithstanding the rocks below. We were in a trap. A sack of flour was jammed against the aperture; rations, guns, cooking utensils, photographic materials, etc., were tumbled in,

any way to get them in quickly; the hatches were battened down, we jumped to our oars, and the man keeping her steady let go. The fierce current seized us and swept us down like a feather. We pulled like madmen; we cleared the threatening rocks; we gained the centre of the river, where our water-logged craft rolled and plunged as if she meant to go to the bottom the next instant. At the first available spot a landing was effected, and boat and cargo were dried out.

September 3d was one of our eventful days. About eight o'clock in the morning we started to run a rapid, of which no good view was obtainable, though we climbed high on the rocks. No sooner were we in the swift water above it than the dangerous character of the place was apparent. It was impossible to avoid going over. The boat gave a single wild leap, and then deluge after deluge rolled over us. A huge wave struck the boat a hard blow on the port bow, and with a quick careen she turned upside down. I grasped impulsively for something to hold on to as I felt myself going down, and was fortunate enough to clutch a spare oar fastened to the outside of the boat. I pulled myself up and glanced around. Not a soul was visible. There was the boat bottom up; there was the receding rapid; there was the dark bend below; and there were the black walls shutting all in; a scene of the wildest grandeur and desolation, with the upturned boat floating along like a worthless, insignificant chip. The other boat had not yet come in view. My companions soon rose to the surface close by, though to me those few lonely seconds seemed minutes, and sighting the boat we pulled immediately to the left wall, where we made fast to a little projection

and paused for breath. The second boat at length arrived, with no other misfortune than the loss of two oars and a rowlock.

In the afternoon of this same day we manœuvred in and out of the alcoves of the granite for a long time to get to the head of a bad rapid, but missed the landing after all. As the boat drifted close to a rock I tried to jump to it, but a lurch at that moment sent me instead into several fathoms of water. I clung to the line and was quickly on the surface again. I lost no time in getting to the boat, which was rushing stem foremost toward the rapid. At this moment two others jumped for some more rocks at a jutting point, intending to stop the boat, but she was going fast now. I climbed in and felt better when I saw that the other oarsman still remained. Together we succeeded, with great effort and good luck, in dropping the boat behind a large rock on the left bank at the very brink of the descent, so that we did not run the rapid stem foremost, as seemed, at first, inevitable. The next morning we lost all control of the boats for four miles, and, though there were no bad rapids, the river whirled, and eddied, and boiled, and broke into great spinning whirlpools that tried their best to suck us under. From one side of the river to the other we went, turning round and round in spite of our efforts to keep straight. At last we ran the granite under, and rejoiced to see the bright-hued, cheerful sandstones again at the water's edge. The river was still rising, and the current was extraordinarily swift.

Several small creeks, heading in valleys back from the river, came in sight. These valleys were really only lateral cañons in the lower tier of walls, which were

about 4,000 feet high, the other 2,000 being left in the background. Along some of these little streams ruins of stone dwellings were found, with fragments of pottery strewn the ground, showing that human beings had long ago found a home in these depths so difficult of access. The ruins were of large stones neatly dressed, and corresponding with the better class of southwestern ruins. They were overgrown with cactus and mesquite.

We were nearing the mouth of the Kanab Cañon now, and, on the afternoon of the 7th, as we were moving down with a swift current and viewing the splendid walls, we saw a narrow cleft on the right, and, almost at the same instant, heard a wild yell that resounded from cliff to cliff. Looking in that direction we discovered it came from the base of the cleft or side cañon, where an apparently diminutive figure like a man was standing on a boulder frantically waving his arms above his head.

Nearer, the object was seen to be in reality a full-grown man, and no small specimen at that ; not a wild one either, but the leader of our pack train. He was delighted to see us, for we were seven days overdue ; and as an old shirt Andy had cast away had been washed ashore here, he thought we had been wrecked, and he was about to abandon the watch in this lonely place, where the sun came only for a brief visit each day at noon, and return up the Kanab Cañon to the distant Mormon settlement he came from. He had brought his mules and men down with great difficulty, for the distance to the open country, up the bed of this side cañon, was over 50 miles, part of the way through running water. We ran the boats a few yards up the side cañon and camped on a sandbank. The next day was Sunday and all took a rest. The

main part of the work was done; the remainder of the Grand Cañon would be easy because the descent was not great. We had travelled 108 miles since leaving the Little Colorado (or $173\frac{1}{2}$ from the head of the cañon), leaving $109\frac{1}{2}$ miles to the end of the cañon, the Grand Wash. The altitude of the mouth of Kanab Cañon is about 1,400 feet, that of the Little Colorado 2,690. We had descended then nearly 1,300 feet in the 108 miles, and, as the altitude of the Grand Wash is 1,000, there only remained some 400 feet for the $109\frac{1}{2}$ miles. The total descent from the head of the cañon, about 173 miles, had been nearly 1,800, while the grand total from Green River station was about 4,700. These figures tell the character of this river almost as well as words can describe. With only about 400 feet more to descend, and with over 100 miles to do it in, we anticipated for the rest of the voyage comparatively easy work. But there was one very bad place—the rapid where the three men of the first party lost courage. There the dreaded granite comes up again; and we knew it took something extraordinary to balk such men as they were. The walls range, the whole distance, from 4,000 to 5,500 feet, and though they are nowhere equal to those above, they are scarcely less wonderful and magnificent.

On Monday morning at breakfast, just as we were thinking about packing the boats to go on, our captain surprised us with the announcement that we would quit the cañon here. The extreme high water, he said, meant certain destruction at the bad fall; it would be foolhardy to go on knowing this. Information reached us, too, of some discontented Indians living on the brink farther down who had planned an ambush for us. We could

have gone to the end in a few days; and sometimes I regret that we did not risk it. The water fell rapidly after we had left the cañon, and probably we would have been successful at the bad rapid; while so far as the Indians were concerned, we were amongst them a few months later and had no trouble. But who can tell?

We unloaded the boats where they were and prepared for the journey up the Kanab Cañon to the Mormon frontier village of Kanab. It seemed hard to abandon our good friends, the boats, to their fate; and I cast back a last glance at them as we rode away. Three years later I made my way again to the spot. The boats had disappeared and no vestige of our presence remained save the Major's old chair, and one of the hatches. That journey out from the river; shall I ever forget it! Owning to the unexpected turn of affairs, I was obliged to content myself with riding a pack-saddle, with ropes for stirrups, on a horse that had a trot like a trip-hammer; but as there was not much opportunity amongst the rocks for trotting, it did not matter. Yet, the last day, I rode 40 miles on this fiendish combination, and had just enough vitality remaining on reaching Kanab to throw my blankets on the ground and crawl into them, knowing no more till I awoke in the bright sunlight, feeling very much as if our wild boat journey down the Great Walled River had been a dream.

RECENT EXPLORATIONS IN EGYPT.*

BY

PROF. FRANCIS BROWN.

Some thousands of years ago the waters of the Mediterranean covered the area now known as the Delta of the Nile, and made of it a shallow, triangular basin, with occasional sandy islands, and an irregular bar, or reef, separating it from the deeper sea. Its shores were of a structure like its bottom, stretching away in rolling sand, especially toward the east and southeast. Into this bay the great Egyptian river flowed, with heavily charged water, which, as the current grew sluggish, at the river-mouths and beyond them, laid its burden quietly down upon the smooth sea-floor. Thus the depth became less, and the land was pushed out inch by inch, and mile by mile, until the sleepy river woke one day to the knowledge that its own indolence had lengthened its journey by a hundred miles.

Yet the river did well,—if not for itself, at least for history and for us. If this mud-deposit, lying 50 feet deep over the old bottom, should be suddenly swept out to sea, it would carry with it some of the most momentous relics of the last three thousand years.

We find in Egypt many civilizations, stratified and more or less absolutely fossilized. The Turkish, the Arabian, and the Byzantine do not concern us now. We

* This lecture was illustrated with fifty-six stereopticon views.

have to do with the Roman, the Greek, and the native Egyptian ; with the Hebrew as an important, but essentially distinct, fragment,—not superimposed upon the Egyptian in the same sense with the others, but adhering to it for a while, and then breaking off,—like a pebble, which, loosened from a conglomerate mass, leaves a depression where it fitted in, but shows, as it gets its freedom, how little its close-grained structure has in common with the mass to which its fortune has long attached it.

The oldest monuments we know in Egypt are those left by the early kings, whose capital was, where we might expect it, south of the alluvial deposits of the Delta, but not far away, at Memphis. Possibly some settlements on the edge of these alluvial deposits, as at San (Tanis), may be as old. Only the spade can teach us, if even that can. The Middle Empire had its seat far up the river, at Thebes. Then Tanis, on the Delta fringe, revived. By degrees the Delta in many parts was found not only habitable but of strategic and commercial importance. The home of the Hebrews in Egypt adjoined the Delta and extended into it. As time went on Sais became the capital, and the Greek civilization flourished in these mud-deposits of the Nile, with its centre at Naukratis and Alexandria.

The work of exploration in Egypt has assumed in recent years a new and hopeful aspect. The Bulaq Museum, founded by Mariette, gives a fixed base of operations ; the Egypt Exploration Fund, cordially befriended by the authorities of that museum, has made division of labor possible, and has accomplished a good deal ; while the recent general permission granted for excavating, under fair conditions, joined with the increasing accessibility of

Egypt, and the growing interest in archæology, has already secured some valuable results. A map indicating all the spots where investigations have been made in the last half dozen years would be well dotted from Mt. Casius to Syene of old.

It would be too much to expect that the enthusiasm of discovery should not sometimes make its way into discussions which must be patient, dispassionate, even frigid, if you please, if their results are to be secure. I shall beg leave, however, in an address like this, to keep criticism, for the most part, in the background, and only—with the modesty befitting one who speaks of lands he has never seen, but also with that freedom which one may claim who has neither axe to grind nor lance to break—entreat those who may have any influence in such matters to cast it on the side of scholarly fulness and precision, rigid argument, and sharp distinction between conjecture and demonstration in all questions of archæological interest, Biblical or other,—whether they arise in preliminary reports, formal publications, or the discussions based on these.

Looking now briefly at a few recent contributions to our archæological knowledge of Egypt, we will, if you please, begin with one of the more recent,—Mr. Petrie's discovery of the Greek city of Naukratis, mistress of ships and of the sea.*

* *Third Memoir of the Egyptian Exploration Fund: Naukratis.* Part I., 1884-85. By W. M. Flinders Petrie. With chapters by Cecil Smith, Ernest Gardner, and Barclay V. Head. London, 1886. Also, Mr. Gardner's "Lecture" (July 6, 1886) in *Report of Fourth Annual Meeting* (Egypt. Explor. Fund), 1885-86. London, 1886. See also Petrie, in *Report* etc., 1884-85, and Gardner, in *Academy*, Jan. 30, Feb. 6, Nov. 13, Dec. 25, 1886, etc. Also, "Naukratis and the Greeks in Ancient Egypt," in the *Quarterly Review*, Jan., 1887.

And here, at once, I begin to regret that no particular achievement of recent discoverers can be presented this evening except in a rude and rapid sketch.

Naukratis was a flourishing abode of Greek traffic and culture, while Sparta was ruling in Hellas, 150 years before Athens drove out her tyrants. It was perhaps the spot where the Greek first planted his foot in Egypt, to establish relations which were to continue and grow till Greeks seized the Egyptian throne. It marks the beginning of continuous Greek influence in Egypt, and Egyptian in Greece. Perhaps its foundations were laid as early as the first quarter or third of the seventh century B.C., in the troublous times when Egyptian monarchs had their hands full with Assyrian invasions, under Esarhad-don and Asurbanipal. Under Psamtik I., who began to reign B.C. 664, it was full of life and commercial power. What it was a century and more later, readers of Ebers will remember to have learned from the vivid descriptions in the "Egyptian Princess." It was a city where Greeks felt themselves at home, traded, and worshipped, and talked—their brighter, sunnier existence standing out in relief against the gloom of Egyptian life, moving, it seems to us, in the constant presence of death and the grave.

This once gay Naukratis, after itself cultivating a long acquaintance with the world underground, disclosed its melancholy and battered face to Mr. Petrie, in the winter of 1884-5. The Egyptian Exploration Fund and the Society for Promoting Hellenic Research* joined in providing him the means to uncover it. The mound of Nebrieh, where he found it, is described as a short distance N. E. of the station of Tel-el-Barud, on the railway

* R. S. Poole, *Academy*, Jan. 17, 1885; cf. also *ib.*, Feb. 27, 1886.

from Alexandria to Cairo.* An archaic Greek statue, brought thence by an Arab, was Mr. Petrie's clue to the spot. He found there, besides other relics of Greek civilization in great abundance, a decree of the "city of the Naukratites,"† two copper or bronze coins (duplicates), with the inscriptions *Nau* (*Nau*), and *Αλε* (*Ale*)—believed to be abbreviations for "Naukratis" and "Alexander," according to which the piece would be an autonomous coinage of Naukratis, and date from the latter part of the fourth century, B.C. He found also sanctuaries corresponding to two of the five named by Herodotus‡ and Athenaeus§ as standing at Naukratis, and Mr. E. A. Gardner, a year later, found two more. Besides this, it appears that ancient geographical testimony is on the whole in favor of the new location for Naukratis, instead of that which places it on the same Nile-branch with Sais, and nearer the sea. Mr. Petrie concludes—and I see no reason to dissent from any important position he here takes—that Naukratis, lying west of the Canopic branch of the Nile, was at a little distance from the river, but directly on a large canal|| leading from the sea. There is still room for investigation as to the exact course of this canal and the Canopic branch of the Nile in ancient times.¶

* R. Stuart Poole (on the basis of a letter from Petrie), *Academy*, Jan. 3, 1885, p. 17.—It is much to be hoped that future publications of the Egypt Exploration Fund will (1) describe with greater detail and exactness important localities and the course of operations upon them, and (2) contain topographical maps.

† *Naukratis*, Pl. xxx., 3. ‡ Herodotus, ii., 159, 178. § Athenaeus, xv., 18.

|| Mr. Petrie infers from Herodotus (II., 97) that this canal, extending southward, was the ordinary water-route from Naukratis to Memphis during the Nile-flood. The writer in the *Quarterly Review* points out that he has made Herodotus speak more explicitly than the language will really warrant.

¶ Mr. Petrie's little map, *Naukratis*, Pl. xxxix., needs careful examination and discussion. Not all of his conclusions are at once obvious.

The chief buildings traced at Naukratis, in two seasons' work, are the great Temenos, or Hellenion, at the S. E. corner of the mound, the temple of Aphrodite, N. W. of this (not shown on Petrie's plan), the temple of Hera (whose location I have not seen exactly given), the Palaistra, the temple of Apollo, and that of the Dioskouroi. Besides these a cemetery, to the northward. The great Temenos was enclosed by walls 50 feet thick and 40 feet high, could hold 50,000 or 60,000 people, and served as the great assembling place and stronghold, a huge tower within it answering the purpose both of defence, in the last extremity, and of a storehouse in times both of peace and of war. It was the most characteristic and representative structure in the whole city. There and elsewhere, almost countless objects were found, largely Greek:—terra-cotta and stone figures, pottery, weights by the hundred, and coins; besides these, tools, scarabs, metal ornaments, and household and votive objects in great variety. Scarab-making seems to have been an industry that early flourished, but it ceased apparently within a hundred years, and after Hophra's time (c. 570 B.C.), the Naukratite factory of these little beetles no longer gives tokens of its existence.

Of something like equal age with Naukratis must be the Graeco-Egyptic remains found by Mr. Petrie last year (1886) at Tel-Defenneh,* quite in the N. E. corner of the Delta, on a watercourse once the Pelusiac branch of the Nile. There seems no reason for doubting the identity, which the name suggests, and the location bears out, of this ruin with the "Pelusiac Daphnae" of Herodotus,†

* Cf. Petrie in the *Academy*, June 26, and *London Times*, June 18, 1886; also *Report* (Egypt Expl. Fund), 1885-6, and *Academy*, Sept. 4, 1886 (describing objects found).

† ii., 30.

where Psamtik I. established a frontier stronghold, and also with the *Stratopeda** or "Camps," which this king assigned to the Ionian and Carian mercenaries who helped him to establish his throne, and which lay on both banks of the Pelusiac Nile. This was the first appearance in Egypt of the Greek hirelings, who worked more directly on Egyptian life than the commerce of Naukratis did. Psamtik, indeed, welcomed the Greeks in all ways, had his son taught Greek, and established the class of interpreters or dragomans, which has not died out from that day to this. Probably his Greek soldiers garrisoned the great fortress of which Petrie found the remains. Most of it, in unaristocratic fashion, had been paying a long visit to its own cellar, where, especially in the kitchen, curious relics turned up, such as the parlor does not often speak of. When they are a good many centuries old, one might perhaps venture,—as even a pauper, if he is aged enough, may take on a shabby venerableness. It is enough to specify an ancient sink, with those remains which insufficient water, or a servant's hurry, may leave in sinks.†

Possibly some of these fish-bones had been picked by teeth that were not Greek. There is every reason to think that this Defenneh-Daphnae represents also the *Tachpanches* (Tahpanhes) of Jeremiah and Ezekiel,‡—an Egyptian city well within the horizon of these prophets. Thither fled the timorous Judæans, fearing Nebuchadnezzar's vengeance for the treacherous murder of his viceroy in Judæa, and in their company were the royal princesses,

* Herodotus, ii., 154.

† Of course not all, nor most, of the objects found belong to this class. Cf. *Academy*, Sept. 4, 1886.

‡ Jer., ii., 16; xliii., 7, 8, 9; xlv., 1; xlv., 14; Ezek., xxx., 18.

and Jeremiah himself. There Jeremiah was bidden to hide stones in the mortar, in the brickwork, at the entrance of the house, and to prophesy that Nebuchadnezzar should set up his pavilion over the spot where they lay. A brick pavement in the open air, before the castle, was found by Mr. Petrie, and little fancy is needed to imagine Nebuchadnezzar seated there under his canopy;—especially since the local name of the massive ruin is, as Mr. Petrie heard it, “The Castle of the Judæan’s Daughter.”

Nebuchadnezzar’s campaign against Egypt, so confidently prophesied by Jeremiah and Ezekiel, is affirmed both by an explicit statement in a lonely historical fragment of cuneiform text from his reign, and by the record inscribed upon an Egyptian statue now in the Louvre. It seems indicated also by Babylonian seal-cylinders found in Egypt; and the presence of the Babylonian king at Defenneh has evidence of its own, in three inscribed cylinders of clay, bearing Nebuchadnezzar’s name, and unearthed by Maspero at Defenneh a year or so before Petrie went there.* That a border fortress like Defenneh, or Tachpanches, as we may venture to call it, would not remain undisturbed by an invading army that penetrated to Syene is obvious, particularly when the Greek mercenaries quartered there were the main defence of the kingdom. The destruction of their stronghold on the Pelusiac Nile—assuming that Nebuchadnezzar destroyed it—may have been the direct occasion of their removal to Memphis by Amasis,† who was co-regent with Hophra

* On the monumental evidence of Nebuchadnezzar’s Egyptian campaign, see A. Wiedemann, *Aegyptische Zeitschrift*, 1878, pp. 2-6, 87-89; E. Schrader, *ib.*, 1879, pp. 45-47; P. Thomson, *Expositor*, x. (1879), pp. 397-403; Theoph. G. Pinches, *T. S. B. A.*, vii., 2 (1881), pp. 210, sqq.; A. H. Sayce, *Academy*, Jan. 29, 1884, p. 51.

† Herodotus, ii., 154.

when Nebuchadnezzar came, and soon after reigned alone. However this may be, the ancient and shattered walls have heard, no doubt, the lament of fugitive Judæans, and the shouts of the triumphant men of Babylon; the flash of Babylonian swords has been seen from the battlements, and the lavish splendor of an Oriental despot has been tremblingly admired by awe-struck spectators. But the stones Jeremiah hid have not been found, and probably will not be. They were stones like any others, but what their presence symbolized has come to pass and left desolation in its track.

Mr. Petrie's excavations at San, ancient Soan (Zoan)—for this identification may be unhesitatingly adopted, especially since Brugsch's careful argument (*Ägyptische Zeitschrift*, 1872, pp. 16, sqq.),—or Tanis, in 1883-4,* were in some respects less satisfactory than others conducted by the Egypt Exploration Fund. Discoveries made here, first and last, chiefly by Mariette, cover a wide range of time, from the XIIth Dynasty to the late Roman period, but a continuous and intelligible history of the town cannot yet be given. The dilapidation, in a literal sense, is extreme. Mr. Petrie's description and plan enable us to understand something of the ancient temple enclosure, and of the monuments previously found, as well as of what he himself turned up. There is a melancholy grotesqueness in his inability to do much more than catalogue the pieces of the colossus of Ramses II., that once stood more than 90 feet high, and to measure the width of its toes! Here was one chief seat of

* *Tanis*, Second Memoir, Egypt Exploration Fund, by W. M. F. Petrie, Part I., 1883-84, London, 1885; also review of same by G. Ebers, *Academy*, March 6, 1886; Miss A. B. Edwards, "Story of Tanis," in *Harper's Magazine*, October, 1886.

that best-known of Egyptian kings, here the invading Hyksos had housed and ruled before him, and here, for fifty generations after him, there was eager, busy civic life; there were splendid buildings, military triumphs, rich and awful worship; and here a few dirty Arabs in our day make desolation more desolate, with their mud-walled huts, their squalid habits, and the grasping narrowness of their petty lives.

The most interesting things of which Mr. Petrie can claim to be the finder at San belong to the Greek and Roman period. Such were the house of Bakakhuiu, a lawyer of the Roman time (2d cent. A.D.), east of the temple area, with 150 papyri, and many household objects; and another house, apparently the residence of a Roman official, noteworthy, among other things, for a curious glass zodiac of fine workmanship and rich decoration, broken, unfortunately into 200 pieces, but partly repaired by the finder; what Mr. Petrie thinks to be a plano-convex lens was found in the same house. But while all this is interesting in its way, the things we care most for, if they are there at all, lie much deeper, and cannot be reached without long and patient digging. They belong to the earlier centuries, the ages of Ramesses and Hyksos and their predecessors, and will tell us some strange stories if they are ever found.

Miss A. B. Edwards has made the very utmost possible of her materials in her entertaining and graphic paper entitled "The Story of Tanis," in *Harper's Magazine* for October, 1886.

A word must suffice for minor excavations by Mr. Petrie and by Mr. F. Ll. Griffith, for some time Mr. Petrie's companion. At El Quantâra, 10 miles east of

Defenneh, Mr. Griffith excavated on a site called 'Tel Abu-Seif, finding various Roman and Ptolemaic remains; in particular a stone with a Latin inscription identifying the place with the camp of a part of the Thracian legion under Marcus Aurelius.* A few miles south of San, at Tel Nebesheh, Petrie and Griffith think they have found *Am*, capital of *Am-Pehu*, or the Tanitic nome.† Mr. Griffith discovered many interesting objects, including foundation deposits (see below) at Tel Gemayemi, between Tel Nebesheh and San; while at Tel Ferain, 16 miles north of Sais, where an Arab village lies, called *Ubtu*, Mr. Petrie feels sure of the ancient Buto, at one time an important place in the Delta; at Senhur, between Tel Ferain and Sais, he finds what he believes to be the Kabasa of Ptolemy‡; and at Kom-el-Hisn, 6 miles south of Nebireh-Naukratis, he, Gardner, and Griffith identified the site of *Amu*, capital of the Libyan nome.§

We may pass now to a brief glance at Naville, and his work under the Egypt Exploration Fund. I shall not presume to take many minutes for his now well-known discoveries at Tel-el-Maskhuta. The general shape of the ruins he uncovered is that of a square, lying between the Fresh-Water Canal, on the north, and, on the south, the old Canal of the Pharaohs, which joined the Nile with the Red Sea. The chief remains within it were what appeared to be a temple area, and the brick structures which Naville identified with the store-houses, or cham-

* Cf. *Fourth Report*, etc. (Egypt Expl. Fund), 1885-6; *Academy*, Sept. 4, 1886.

† Tel Nebesheh = Tel Bedawi = Tel Farun. On excavations here, see Petrie, *Academy*, Feb. 5, 13, 27, March 25, April 10, 1886; also *Fourth Report*.

‡ *Academy*, March 13, 1886, p. 189.

§ *Academy*, Jan. 2, 1886, p. 16.

bers, characteristic of Pithom.* The identification with Pithom does not depend on these "store-chambers," though if they are such, they would confirm it, but upon abundant references to the god *Tum*, on monuments found at Tel-el-Maskhuta, and particularly by the five-fold occurrence of the name *Pi-tum*, "Place of Tum," on these monuments. This, joined with the probability of the location, and with monumental evidence that the city was not older than Ramses II., gives the identification a high degree of likelihood.

Not this, but two other discoveries here have some bearing on the route of the Israelites out of Egypt. On these, only a word or two :

The name *Thuku* or *Thuket*, known already as that of a city and a district, and identified by Brugsch, Naville, and others with the Hebrew Succoth,† was found by Naville at Tel-el-Maskhuta. He thinks, therefore, that Thuket was another name for Pithom, and was the name also of the region about. In the latter sense he takes it in the Exodus story. I am free to confess that it does not seem to me as yet more than a hypothesis that Thuket and Succoth are the same name, nor does it appear likely that if the Israelites' starting-point, Ramses, is a *city*,—and the burden of proof rests with those who question it,—the first stopping-place should be any locality not equally definite. I am, therefore, not able to feel confidence in Naville's designation of this first halting-place.‡

* That these were "store-chambers" is denied by the Rev. G. Lansing, D.D., *Monthly Interpreter*, Nov., 1885.

† Exod., xii., 37, etc.

‡ Cf. on this, and the following, and on Naville's further identification, Pihahiroth-Pikerehet, A. Dillmann, "Ueber Pithom, Hero, Klysmä. nach Naville," in *Sitzungsbericht der Königl. preuss. Akad. d. Wiss. zu Berlin*, 1885, xxxix. (July 30); also, Rev. C. R. Gillett, in *Old Testament Student*, Jan., 1887; *Presbyterian Review*, April, 1887.

Near the enclosure marking Pithom, Naville found other ruins, and here were two inscriptions with the name Ero (Hero, the Greek Heroöpolis). The importance of the discovery lies in the fact that since ancient geographers represent Heroöpolis as a port of embarkation on the Red Sea, and habitually call the western arm of that sea the Gulf of Heroöpolis, it would appear as if the Gulf of Suez must have extended up at least to Lake Timsah, and the site of the present Ismailia. Naville brings it still farther to the N. W. It would be impossible in brief compass to make an intelligible statement of the conflicting and obscure historical evidence in the case. It appears to me that the balance is, on the whole, in favor of an extension of the Gulf of Suez much north of its present limits in ancient historic times. Geology puts no veto upon this, for, it is strongly argued by Sir J. W. Dawson* and Prof. Edward Hull† that the Isthmus has been in recent ages tipping from south to north, and this view is quite independent of the opinion of the Rev. C. R. Gillett,‡ based on expert testimony, to the effect that the hardest ridge of rock between Ismailia and Suez was, when the Suez Canal was cut, 6 feet below the level of the Gulf.

Yet, if, as seems likely, the sea once came up to Lake Timsah, or beyond, this in no way solves the question of the route of the Exodus. It only extends the stretch of water at some point of which the passage of the sea occurred. I incline, on slight indications, to a point well

* *Egypt and Syria*. (By-Paths of Bible Knowledge, vi.) Lond., 1885, p. 58.

† *Mt. Seir, Sinai, and Western Palestine*, London, 1885, p. 186. Also, *Pal. Expl. Fund Quarterly Statement*, April, 1884.

‡ *Independent*, April 14, 1886, p. 7.

north of Suez, but, in our present topographical ignorance, who shall assume to say the final word ?

It remains, before passing to what I trust will be more entertaining, to note in a sentence or two some later explorations of M. Naville. In 1885, after trying several spots, he undertook work at *Saft-el-Henneh*, 6 miles E. S. E. of Zagazig.* He found here a shrine dedicated to Sopt, god of the Arabian nome. The Arabian nome, as we know, contained a place called Kesem, and Pa-Kesem, and an inscription from Saft-el-Henneh bears the name of the place Kes. Now, since Goshen is called by the LXX *Gesem Arabias* (Γεσὲμ Ἀραβίας), or Gesem of Arabia, Naville thinks he has found the very Biblical Goshen monumentally attested, particularly since Saadia, in his Arabic version of the Bible, translates Goshen by *Sedir*, identified with a region north of Belbeis, which would naturally include Saft-el-Henneh. All this, however, needs much more careful study, and in particular the claims of Fakûs, 20 miles N. E., to the inheritance of Pa-Kesem, are not to be ignored. Similar caution may well be observed in answering Naville's inquiry, in view of a statue of Ramses II., and an old Itinerary, putting Ramses, a city, built by the Israelites, 4 miles from the capital of Arabia, whether Saft-el-Henneh was not originally the city of Ramses. Perhaps M. Naville's forthcoming book on "Goshen" will set these matters in clearer light.

Recent letters from Naville, in Egypt, announce the discovery of various traces of the Israelites in local names, about Belbeis, and mounds in that region, but the reports are not yet definite or striking enough to be presented here. †

* See his lecture, in *Third Report*, etc. (Egypt. Expl. Fund), 1884-5.

† Cf. *Academy*, Feb. 10, 1887.

And now, if you please, we will leave these geographical questions, and go back for a brief glance at some objects found at Naukratis, Pithom, and Tanis, before we start up the Nile.

From Naukratis I call your attention (1) to a number of alabaster statuettes of the sixth century B.C.

(2) To specimens of pottery from the sixth century and the fifth.

(3) To a beautiful bowl, of what is called "Cyrenian" ware, from the sixth century.

I do not attempt to enter upon any details, which belong to specialists, nor even to do more than barely mention a peculiar kind of ware dubbed "Naukratis pottery."

A word about the inscriptions from Naukratis. These are, for the most part, scratched on pottery, and are of special value for the history of the Ionic alphabet. Most of them are brief dedications, few contain any other name than that of a god, and in only one case does the name give a clue to the age. Readers of Herodotus will remember the Greek general in Egyptian service * who went over to Cambyses, before Cambyses invaded Egypt, and what I fear may be the larger number, who take their Herodotus at second hand, will perhaps recall the figure of Phanes in Ebers' romance, to which I have already referred. It is interesting just here, because this Phanes came from Halicarnassus, and because one Naukratis bowl bears the dedication of Phanes, son of Glaukos, to the Milesian Apollo.

The coins, weights, and beetles we will pass by.

(4) The tools and weapons are not uninteresting. The

* Herodotus, iii., 4.

collection from Naukratis includes, among other things, a sword, arrow-heads, a lance-head, an adze or hoe, a poker, a knife, fish-hooks, chisels, borers, an axe, a bodkin.

(5) Archæologically more interesting still are the ceremonial foundation deposits found by Mr. Petrie at Naukratis, Tel Nebesheh, and Tel Defenneh, and by Mr. Griffith at Tel Gemayemi. Those at Defenneh were placed by Psamtik I. (seventh century), those at Tel Nebesheh by Amasis (sixth century), and those at Naukratis by Ptolemy II. (Philadelphus), in the third century, B.C. They consisted of implements for sacrifice, models of tools used, and samples of building materials, from a Nile mud-brick to costly stone and precious metals; more particularly, at Naukratis, there were a bronze axe, trowel, adze, chisel, iron hoe, mortar-rake, alabaster pegs, a cartouche of Ptolemy II. (lapis lazuli), green pottery libation vases, green pottery cups for offerings, a bronze knife, an axe, samples of green glazed pottery, a brick of Nile mud, gold, silver, lead, copper, iron, turquoise, jasper, lapis lazuli, agate.

From Tel-el-Maskhuta, or Pithom, attention may be called to (1) a Hyksos Sphinx, recut by Ramses II.;

(2) A Triad of divinities; probably Tum, Hathor, and Hor Sam Taui. Cf. *Pithom*, p. 32;

(3) A figure, which is not a sphinx, but a crouching or squatting man, with the arms resting on the knees. This is the famous statue of Ankh renp nefer, "the good recorder of Pi-Tum" under the XXIIId Dynasty. The statue is of red granite, and the front bears a naos, or shrine, with a figure of Osiris. The name and title, just given, are inscribed on the right of the naos;

(4) The Hawk of Horemkhu;

(5) Inscriptions of geographical importance, determining the position of Heroöpolis;

(6) One of the "stone chambers," which has been published in photograph, showing the shape and the outlines of the bricks.

From San may be mentioned :

(1) A head of Amenemhat I. (XIIth Dynasty), in red granite, part of the oldest statue known to belong to Tanis.

(2) A head of Ramses II., in red granite.

(3) A figure, perhaps of Ptolemy II., with tablets.

(4) The figure bearing the name Bakakhuiu, believed to be the lawyer of Roman times, whose house was found, east of the temple, with many curious objects.

Now we are at liberty to move farther south.

While recent discoveries in the Delta have been chiefly on new sites, and have increased geographical knowledge, those at Memphis and farther south show what surprises await the explorer in more familiar regions. With the great freedom now allowed the excavator in Egypt—thanks to the government, guided by the large-minded policy of M. Maspero,—discoverers are busy like bees all up the Nile valley. The most important work, however, has been done under the direction of Maspero himself.

Before speaking of this, however, a single word about some late operations carried on at the southernmost point to which our attention will this evening be directed,—far up the Nile, at Assuan and Philae, at the first cataract. Assuan, six hundred miles from Cairo, by the river, is the outpost station of Egyptian troops under British command, and the chief officer of the garrison, General Grenfell, has been making archæology his debtor, by employing

his soldiers for archæological work, in the fortunate absence of taxing military demands.* Thus he has conducted a series of valuable excavations along the cliffs on the left bank of the Nile, opposite Assuan, and found rock-hewn tombs in great numbers, some of them as old as the VIth Dynasty. Besides this he has had a considerable number of Coptic buildings, the ruins of which disfigured the remains of the great temple at Philæ, taken away, and is showing himself a real and energetic lover of antiquity and friend of learning.

After this distant excursion we return to Memphis for a fresh start, passing over many things, by the way, of greater or less account, and specifying only the revived interest in *graffiti*,—rude scratchings on the stones at Akhmim, Luxor, and elsewhere,—some of which have been observed but lately, and to which Mr. Petrie is now devoting careful attention,†—and mentioning, to show that it is not forgotten, Mr. F. Cope Whitehouse's work in surveying the Fayûm.

From Memphis southward the chief explorer has been M. Maspero, until lately director of the museum at Bulaq, Cairo.

Among other tasks Maspero began last year (1886) a vigorous attempt to solve the ancient problem of the Great Sphinx.‡ In front of it 100 feet or more of

* *Academy*, March 13 and 20, May 1, 1886.

† Maspero, Report; *Acad. des Inscr. et Belles-Lettres*, 1886; cf. *Academy*, Aug. 14, 1886, and letter from W. M. F. Petrie, *Academy*, March 27, 1887. For other discoveries see the above publications, *pass.*, and *Mémoires publiés par les Membres de la Mission Archéol. Française au Caire, 1881-1884.* Paris, 1884-1885.

‡ Maspero, Report; *Académie des Inscr. et Belles-Lettres*, June 18, 1886. Cf. *Academy*, Aug. 14, 1886, and letter from W. M. F. Petrie, *Academy*, Jan. 8, 1887.

sand have been dug away; about the same distance from the face a flight of descending steps, 40 feet wide, of late workmanship, has been disclosed, the stele of Thutmes IV. has been uncovered between the paws, but unfortunately the cartouche of Khafra, the ancient, has flaked off from it. Mr. Petrie writes to the *Academy* that there is evidence to the effect that Thutmes, with all the respect he, on this stele, claims to entertain for Khafra, actually stole the block on which his ascription is engraved from the temple of Khafra, whose ruins lie just to the southeast. The theory proposed by Maspero with regard to the basin, or amphitheatre, in which the Sphinx lies, and the edges of which show everywhere, we are told, marks of artificial cutting, is that this amphitheatre was hollowed out by human workmen, who left in the middle the huge block out of which the Sphinx was carved. That any given achievement of engineering and construction must have baffled the skill and strength at the disposal of Egyptian monarchs, few will dare to say. The probabilities would favor at least an original formation of the rock, such as by its shape might support such a work, and contribute to lessen the vast difficulty of its accomplishment. There is as yet, we are assured, no proof that the temple close by was in any part hewn out of the rock. Recent diggings about it disclose in its structure only huge placed stones. However this may prove, the stone image around which the diggers are at work grows, no doubt, more majestic, the more it is revealed, in spite of the patches and restorations of younger ages,—the Roman paws, the slabs inserted and themselves in turn repaired to save the crumbling surface of the breast.

Besides these operations near the Great Pyramid, within five or six years Maspero has opened all the pyramids at Sakkâra, and others at Dahshur, Lisht, and Meïdum, a little to the south, and has made extended examinations of the *mastabas*, or private tombs of Lower Egypt.* He has been active, also, at several points on the way up to Thebes, as well as in and about Thebes itself. Akh-mim, 100 miles below Thebes, Neggadeh, just north of Thebes, Taûd and Rizigab, just south of it, are among the scenes of his work. One of the latest tasks he undertook was the clearing away of intrusive modern buildings from the temple ruins at Luxor.† But the most brilliant discoveries have been made on the other side of the river.

It will be remembered that the great temples now known by the names of Karnak and Luxor are on the right bank, where the palaces were, the dwellings, commercial buildings, and other structures, public and private, belonging to the daily life of the living population of Thebes. On the left, or west bank, lay the Necropolis, with its tombs and splendid monuments, and with the great numbers of priests and people who were engaged in funeral or memorial services, or who made their living by embalming, and by furnishing meat and bread, wine and flowers, for burial and for sacrifice. Of the ruins which abound in this Necropolis it is enough to name now the memorial buildings of Thutmes III. and of Ramses III., now known as Medinet Abu, the Ramesseum (sometimes called Memnonium) of Ramses II., the rock-hewn Temple-tomb of Dêr-el-bahri, north and west of

* *Mémoires publiés*, etc., Paris, 1884-1885; Maspero, "Trois Années de Fouilles."

† *Comptes Rendus*, June 18, 1886.

which, passing round the hill, runs the path to the Valley of the Tombs of the Kings. On this west bank are also the two colossal statues of Amenophis III. (XVIIIth Dynasty, marking the entrance of his (now destroyed) memorial temple), of which the northernmost, called by the Greeks *Memnon*, and connected with a Homeric hero, through a misunderstanding of the Egyptian *mennu*, "great monument," used to respond to the sun's morning greeting, and stirred the superstitious fancies of many generations.

Three discoveries in this Necropolis demand attention before this hasty survey of recent exploration in Egypt is brought to a close,—one at Kurmet Murrai, and the other two on the hills about Dêr-el-bahri. At Kurmet Murrai, a little to the N. W. of Medinet Abu, Maspero was fortunate enough, in Feb., 1886, to light upon a tomb with the seal unbroken,—a tomb, that is to say, which had hitherto escaped the thievish cupidity that has deprived most of the Egyptian burial-places of half their archæological value by stripping them of whatever seemed to have money worth. Mummy cases, with colors of brilliant freshness, and the shrivelled mummies in them, were here, untouched since they were laid away, and a full and curious set of the objects,—a shrine, figures, implements, and vessels,—belonging to the service of the dead, was disclosed. The tomb dates from the XXth Dynasty, and contained the bodies of an official of the cemetery where it lay, who died in the reign of Ramses IV., with his wife, his children, and his servants. For 3,000 years they have been quietly resting there,—till Maspero unlocked the door, a year ago.* What gives us a close interest in this tomb is the

* Cf. *Academy*, March 20 and August 14, 1886, and M. Maspero's Report, *Acad. des Inscriptions et Belles-Lettres*, July 16, 1886.

fact that from it, as well as from Akhmim, have come most important parts of that singularly choice Egyptological collection now in our Metropolitan Museum, which only awaits the hall that is building for it, to be exhibited to the public.

The second Theban discovery we are to notice was made by Maspero in 1883. The tomb of Horhotpou, a private man, from the time of the XIth Dynasty, as Maspero judges, he found on the slope north of Dêr-el-Bahri, beside the path leading to the Tombs of the Kings. It consisted of a chamber cut in the soft rock and lined with white limestone, and a sarcophagus built up of slabs of the same material. These are noteworthy, both in their difference from the earlier Memphitic tombs, as to mode of decoration, and still more in their resemblance. The difference is that the hieroglyphics in the tomb of Horhotpou are cursive, and that the texts found are such as belong, not to private, but to the royal tombs of the VIth dynasty in Lower Egypt. The paintings and symbolism of what awaits the soul after death are, however, essentially alike, and Maspero deduces a new argument for the substantial identity in art and in religious ideas between the two epochs, separated in place and in time.

In this tomb, too, we have a local interest, for one piece of stone from the foot of the sarcophagus, stolen from the place by some thievish Arab long before Maspero explored it, has been identified with a limestone slab now in the Abbott collection at the rooms of the New York Historical Society, where it is numbered 380. It shows the peculiarly variegated border, said to be unique in coffins of the period, and is covered with cursive hiero-

glyphs, containing, among other things, the name of Horhotpou himself.*

The most surprising discovery of all has been that, so widely published, of the 36 royal mummies in one cavern, a little to the south of Dêr-el-Bahri. It came about through the consummate generalship and intrepidity of Maspero, who, after squeezing the secret out of one of the robber-band who had been rifling the tomb at their leisure, and selling its notable contents piecemeal, was obliged, because of his departure for Europe, to leave the actual investigation of the place to his associate, Emil Brugsch-Bey, brother of the renowned Egyptologist. He found a royal burial-chamber of unaccustomed structure, and with contents simply astounding.

"Dêr-el-Bahri" (Monastery of the North) is a name given in Byzantine times to a religious house erected on the ruins of a splendid temple-tomb; this was built by the famous queen Hatshepsu, sister of Tutmes II. and III. of the XVIIIth Dynasty. We do not know that she was buried there. Most of the kings of this period had their tombs, as is well known, cut out of the rock at the sides of the valley called Bab-el-Muluk, "king's gate,"—or "Valley of the Tombs of the Kings," behind the ridge of Dêr-el-Bahri.

Recall the characteristic features of Egyptian tombs. Most simply stated, they were: a chamber for offerings and commemorative gatherings, and another chamber for the sarcophagus containing the mummy, reached commonly by a shaft or well. Among the oldest tombs

* *Mémoires publiés par les Membres de la Mission Archéol. Française au Caire, 1881-1884.* Maspero, "Trois Années de Fouilles." (On the New York fragment, see pp. 135, 172.) Also *Guide du Visiteur au Musée de Boulaq, Boulaq, 1883, pp. 251-257.*

known in Egypt are the *mastabas* of Lower Egypt, solid structures looking like the segment of a huge obelisk, with the commemorative chamber let into one side, and the well leading to the sarcophagus-chamber generally quite disconnected from the commemorative chamber, and opening through the top of the *mastaba*. A third feature was the *serdab*, or narrow, walled-up room in the *mastaba*, where images of the deceased were preserved. The plain of Gizeh (*e. g.*) was covered with these structures.

The section of the great pyramid shows also several chambers, one below the surface of the ground. The pyramids were to the kings what the *mastaba* was to a private citizen.

Coming up to Beni-Hassan, we find tombs hewn in the rock, whose solid mass is carved into pillars at the entrance. Within there is the chamber and the well for the sarcophagus.

At the "Tombs of the Kings," in the Necropolis of Thebes, we find plain entrances, but great splendor behind them. The tombs of Seti I. and Ramses II. have long been famous. In private tombs of the period we still find the two characteristic chambers. But in these royal tombs all the succession of decorated rooms which are here to be observed are really an extension and expansion of the single sarcophagus-chamber; the commemorative chamber has, in its turn, expanded into a temple, become separated from the tomb itself, and taken the form of such noble structures as the Ramesseum, and the buildings clustered at Medinet Abu. Moreover it was still the stringent rule, that each sovereign should have a tomb of his own.

The burial-place found by Emil Brugsch was quite

different. Its entrance was a ruinous cavern, immediately descending in a perpendicular shaft to a depth of nearly 40 feet (11.50 metres), and then passing by a horizontal passage, too low for a man to stand upright, and with one sharp bend at right angles, until, some 200 feet from the bottom of the vertical shaft, the mortuary chamber was reached, fairly populous with famous dead. The most renowned kings of the XVIIIth and XIXth Dynasties, Amenophis I., Tutmes III., Seti I., Ramses I. and II., and other kings and queens down to the XXIst Dynasty,* were here packed in together, and these, with such of their belongings as were left to them, by the rapacity of thieves, were dragged out through the narrow passages, lifted up into the light of day, transported to the river bank, after almost superhuman exertions and incessant vigilance on the part of Brugsch, were put on board steamers that came up to take them, and, with crowds thronging the shore, in awe and wonder, and with glimmerings of national pride, were conveyed down the venerable stream they had so often sailed over in despotic luxury, to find a new resting-place in a museum founded and sustained by peoples which began to be long after they had closed their eyes for the last time.†

* The views exhibiting the entrance to this tomb, and its plan and section, as well as one showing the topography of Dêr-el-Bahri, were made for this lecture from cuts in Miss A. B. Edwards' article, "Lying in State in Cairo," in *Harpers' Magazine*, July, 1882, by the kind permission of Messrs. Harper and Bros.

† On this discovery of July 6, 1881, at Dêr-el-bahri, see *La Trouvaille de Deir-el-Bahari*, by Brugsch and Maspero, Cairo, 1881 (20 photographs, with 10 supplementary); Maspero, "Sur la Cachette découverte à Dêr-el-Bahari," in *Verhandlungen des 5ten Intern. Orientalisten-Congresses* (Berlin, 1881), 2ten Theil, 1ste Hälfte, Berlin, 1882; Amelia B. Edwards, "Lying in State in Cairo," in *Harpers' Monthly Magazine*, July, 1882; Georg Ebers, "Ein Friedhof ohne Gleichen und Vierzig Auferstandene Könige," in *Die Gartenlaube*, Leipzig, 1886, Nos. 42, 43, 45, 46, 47.

This discovery was not merely an amazing one, by reason of the fame of the kings whose remains were found, and the strangeness of the tomb; it propounds questions, part of which only conjecture can answer. It seems likely, in the first place, that the XXIst Dynasty, instead of a separate place of sepulture for each ruler, preferred—whether for sentimental or practical reasons—a family tomb;—that, therefore, the sovereigns of this dynasty who were found in the rock-chamber at Dér-el-bahri, and none of whose tombs have been discovered elsewhere, were reposing where their reverent successors had laid them. They were, then, so to speak, the hosts, and the elder sovereigns their venerable guests. But these guests had come with less stateliness and dignity than in life they might have wished. As one saved from a shipwreck or a burning house takes with thankfulness the garment offered him, without nice anxiety whether his name is marked upon it, and as he submits without a murmur to the discomforts of crowded rooms, and perhaps short rations, so Ramses II., *e. g.*, had to take up with a mummy case two or three hundred years too young for him, all the new-comers were forced to be content with such place as they might find in the sleeping-chamber of royal people who at least offered them all they had, while the sepulchral repast of mummified mutton, gazelle, and goose, provided for one delicate queen, was the main reliance of vigorous heroes and conquerors of the older days.

That only the stress of need could have brought kings to this pass, demands no argument. It is presumed that they were driven, not by fire or flood, but by fear of that same greedy and unsentimental class of men that

had, in our day, found them out in their last hiding-place,—grave-robbers, jewel-thieves, body-snatchers. Curious Egyptian documents have already attested the existence of such bad men even in those unsophisticated times, and have depicted their ravages. Perhaps the experience of centuries taught the monarchs of Egypt that in view of the rapacity of man, one snug house, with a single, easily guarded door, offered more security for them all than many scattered palaces of the dead. That this thought actuated the monarch of the XXIIId Dynasty who brought these patriarchs among the kings together in the tomb of his own predecessors, there can be little doubt. Official records on the bandages and cases of some of the mummies from Dér-el-bahri tell us that they had already wandered from place to place. Whether, as some have thought, from this and other evidence,* the splendid royal tombs were meant only as temporary resting-places, so great was the constant fear of the spoiler, I do not venture to say. It appears certain that Ramses II. had travelled from his own tomb to his father's, thence to Queen Ansera's, thence to King Amenophis', thence back to Seti's, before he found his way down the gloomy shaft, where he was to spend a little matter of 2,800 years,—the magnificent and boastful conqueror and wholesale robber thus dodging about among the Theban rocks to escape the harassing and contemptible robbers *in petto*!

But even with a more living subject than mummies, it would not be proper to keep you here far into the night. In addition to a few matters of detail that will almost explain themselves, there is one, perhaps less familiar

* Cf. Wiedemann, *Aegyptische Zeitschrift*, 1883, p. 126.

than many others, which is curious and interesting, and is amply illustrated by the discoveries at Dêr-el-bahri. I refer to the use of flowers in mummy-decoration. These symbolized the garland or wreath of justification which the dead might hope to wear before the judgment-seat of Osiris, in the underworld of the West.* This was often painted on the coffin, and was often represented by actual leaves and flowers in the case of persons of high rank. Some of these flowers thus wreathed and festooned about the mummy were foreign plants, cultivated for the purpose in temple-gardens. They were variously disposed within the mummy-case. Single flowers might be inserted between the outermost bandage and the cloth enclosing the mummy, masses of leaves might be crowded between the mummy and its case, wreaths might be laid upon the remains, or the upper part, from neck to waist, might be draped with festoons. The mummy of Amenophis I., the same with which a wasp was found buried, was hung with garlands consisting of willow-leaves folded twice, and strung on a slender strip of date-palm leaf, the folded willow-leaves serving as a sort of clasp to retain blossoms of the Nile-acacia inserted between the folds. In like manner the mummy of Ramses II. was adorned with festoons of *Mimusops* leaves (*Persea*) folded in the same way, the pendant in this case consisting of petals from the blue lotus. The separate rolls were held in place by date-palm-leaf fibres serving as threads. The leaves, originally of firm texture,

* W. Pleijte, "La Couronne de la Justification," in *Actes du 6ième Congrès Internat. des Orientalistes, tenu en 1883 à Leide*, Part IV., Sect. 3, pp. 1-30, and 25 plates (Leiden, 1885); also, G. Schweinfurth, "Der Blumenschmuck ägyptischer Mumien," in *Die Gartenlaube*, Leipzig, 1884, No. 38, with 3 illustrations.

have, in carefully enclosed mummy-cases, remained in good condition, and many of the flower-petals have kept their bright colors, a bit of cheerfulness amid all the sombreness of dusty decay.

Other matters I need do no more than mention. The flasks of Queen Isim'heb's toilet, the Ushebti figures that represent the serving-people who were to labor for her in the fields of the blessed, the jute basket with its mummified joints of meat for her sustenance,—these illustrate the minor objects found. Of the richly decorated canopy which protected her funeral barge it is impossible to give a proper notion, either by description or by any picture I have been able to secure.

It remains only to name, from the number of these mummies upon whose faces the light of the nineteenth-century sun has been allowed to shine, those that are perhaps the best preserved: The priest Nibsoni (XXIst Dyn.), lying in his coffin with uncovered face; the king Pinet'em, commonly called the II^d, of somewhat Ethiopian appearance; and finally, that monarch of whom so much has been said, probably not the greatest of the Egyptian kings,—a title we shall do better to reserve for that diminutive body and intrepid soul that made up together the restless and dreaded conqueror, Tutmes III.,—but certainly the best-known sovereign of the Nile, Ramses II. He is ubiquitous in Egypt. He set up his statue almost everywhere, and where he could not erect a statue he wrote his name (as on our obelisk). A picture of him as a child is preserved in the Louvre. The image of him now at Turin is one of the most famous representations of him in full vigor. There is a stately colossus of him in the museum at Bulaq, where it now has as companion-

pieces the huge mummy-case of Queen Ahmes-nefer-ateri and Queen Ah-hetep, her daughter, one the mother and the other the sister and wife of Amenophis I. (XVIIIth Dyn.), both found with him and Ramses in the secret tomb at Dêr-el-bahri.

Ramses II. reigned two thirds of a century, and was probably at least ninety when he died. How much of that affection of subjects and respect of adversaries he enjoyed, which has fallen to the happier lot of the royal nonogenarian of our own day, we cannot tell. This life is sometimes said to be just now the key to the peace of Europe. It is hard to think that even fourscore years and ten could have turned Ramses II. into a peace-lover or a peace-maker. His features do not show it. It is a cruel, hard old face, wearied but not softened by the pressure of the years.*

Among us it has grown familiar to fashionable shoppers and careless school-boys.

If he was really the Pharaoh of the oppression, one may find a subtle punishment, as well as an irony of fate, in the fulfilment of that desire for earthly immortality which led him to multiply his inscriptions and his statues, by the exposure of the features sacredly covered 3,200 years ago,—securing his fame through what to him would have been sacrilegious outrage, and sending him out into a world larger than he dreamed of, not as a conqueror, but as an ancient and ghastly curiosity from a rifled tomb. Yet perhaps he cares less about it now than he once could have supposed it possible he should.

* On the recent unrolling of this and other mummies, see *Revue Archéol.*, July-Aug., 1886, and plates xii.-xiv.; *Academy*, July 3 and 31, 1886; *American Journal of Archaeology*, September, 1886, pp. 331, *sq.*, etc.

COLONEL CHAILLÉ-LONG ON THE JUBA.

The following statement summarizes the work done by the special expedition to the Indian Ocean under the command of Col. Chaillé-Long, despatched by His Highness Ismaïl, Khedive of Egypt, in June, 1875.

It was with the purpose of conquest that Ismaïl adopted the inspiration of General Gordon for the expedition to the Indian Ocean.

In obedience to General Gordon's order, I hastened to confer with the Khedive. At Khartoum he telegraphed me :

"Received your telegram about Mombas to M'Tsé. Study expedition with Gordon, then come to Cairo. It should be kept a profound secret. ISMAÏL."

Arrived in Cairo the 23d of May, 1875, I was welcomed with much enthusiasm by the Khedive.

Early in September the preparations were completed, and on the night of the 16th I left Cairo for Suez.

My orders read to proceed to Berbera, confer with McKillop Pasha, and, with him, sail at once for Juba.

Keith Johnston, the geographer, says in his book entitled "Africa," that "in 1874 the town of Berbera, on the Somali coast of the Gulf of Aden, was occupied by the troops of the Khedive, and the whole coast of the Danakil country, between that and Massowah, with most of its ports, was taken possession of by Egypt. The harbor of Zeilah was made over to Egypt by the Porte in July, 1875, and later in the same year the Khedive's troops marched thence inland and took possession of Harrar.

"Not content with this, the Egyptians grasped the ports of Brava, Juba, and Kismayu, on the east coast, in January, 1876."

This, in fact, was the work in which McKillop and myself were now actually engaged.

Berbera, opposite Aden, is situated in the arc of a deep bay, bordered by a sandy plain which stretches its locked arms into the sea, forming a breakwater and good harbor. It was here that we arrived on the 25th of September.

On the 30th the expedition, reinforced by two companies of infantry and a detachment of artillery, sailed from Berbera to Cape Guardafui, which we passed on the 4th of October.

Ras Hafoun was reached on the 6th of October. I landed with a detachment of soldiers, and planted upon the highest peak the flag of Egypt. This done, a proclamation announcing the Khedivial authority was read and the flag was saluted.

On October 15th our expedition took position before the fortified town of Brava. Lieutenant Hassan Wassif was sent on shore, and the officer commanding the troops of Zanzibar agreed to capitulate. A company was sent to occupy the fort, which was found already abandoned.

Twenty-four hours later we arrived off the mouth of the Juba River, the objective point of our expedition. A Somali fisherman came off and said it would not be possible to enter the Juba at this season, but that we could find a good harbor at Kismayu, and accordingly we got under steam for that point.

Kismayu is situated fifteen miles south of the equator, in the bend of a land-locked basin half a mile wide, guarded on each side by huge boulders of rocks. In the

afternoon of the 16th we succeeded in entering the port. In the distance was a stone fort, mounting several guns, bearing directly upon the pass.

Daylight the next morning found four companies, with several field pieces and a *mitrailleuse*, in position on the beach in front of the town. The sheiks were bidden to demand the surrender of the place in the name of the Khedive of Egypt. After waiting for some time for a reply, I detached a company, gained the rear of the town, and Kismayu was in our possession. We subsequently learned that Dr. Kirk, Her Majesty's consul, and Mr. Badger, an agent of Saïd Burgash, were hurried away to Aden on the Sultan's steamer, and telegraphed to Lord Derby as follows :

" The Egyptian pirates are in my land. Have taken my commerce and country, and massacred my soldiers. Come to my aid. SAÏD BURGASH."

Kismayu was a great slave-trading port, and I set free the 400 slaves found there.

Dr. Kirk was knighted for his promptness in reporting the Egyptian invasion.

Kismayu was occupied in force on the 17th of October, 1875, and McKillop assumed command of the coast from Berbera to the equator.

On the Juba River I built a fortified town, on an eminence overlooking the plains of Juba and the Indian Ocean.

On the 16th of November the steamer *Mahallah* arrived at Kismayu, with Frederico Pasha and Ward Bey, the latter an American officer, sent down to make a hydrographic survey of the new port. The *Mahallah* brought me a reinforcement of troops. Frederico Pasha

turned over to me a steam-launch, and I determined to make a *reconnoissance* along the river.

The Juba was first entered by Baron von der Decken, on July 29, 1865. He pushed as far as the town of Bordera, a city on the left bank of the river, surrounded by a wall fifteen feet high. The inhabitants were Somali Arabs, of the tribe of Ali, a powerful tribe to the south and west, and occupying also the country between the Juba and the Wobbi rivers.

Baron von der Decken, on the 25th of September, of the same year, in endeavoring to push beyond Bordera, unfortunately ran his steamer on the rocks in the rapids, and he and his party were doubtless murdered by the treacherous Somali.

On the 24th of November we left camp at 6 A.M. It was 6 o'clock P.M. when we arrived at Yerkoi.

Thence we passed, at intervals of two or three hours, the villages of Hinde, Sugwari, Donzoni, and Zanzibar. A three hours' run brought us to Bonini. From Bonini we steamed to Lugeto, two hours distant, and thence to M'Kou M'Wooli, where we anchored for the night.

On the 27th, having received the visit of the sheik and exchanged presents, we steamed away at 4 A.M. At nine o'clock we arrived at a village 150 miles from our camp. It was the limit of friendly territory, and Ali said he dared go no farther. An island five miles in length and one fourth wide here divides the river into two branches. I was quite satisfied with the information obtained, and, after a distribution of presents, the return was ordered. We arrived at camp at 1 o'clock A.M. on the morning of the 28th.

On the 6th of December the monsoon set in, and blew

with violence. The 25th, Christmas Day, brought us a welcome visitor, the *Tantah*, returning from Suez and making her way to Kismayu. During the day I received a dispatch from the Khedive: "Withdraw your command at once, and return to Egypt." Lord Derby had protested against the occupation, and sent a peremptory note.

The rest is soon told. The expedition evacuated the Juba on the 5th. On the 11th it withdrew the detachment from Brava, sailed for Berbera, and thence with McKillop to Suez, arriving in Cairo on the 6th of February, 1876.

C. CHAILLÉ-LONG.

GEOGRAPHICAL NOTES.

LAKE TRAVERSE AND FEATHERSTONEHAUGH.—In the *Proceedings* of the Royal Geographical Society for February it is noted that, in his pamphlet on Capt. Glazier and his lake, Mr. Harrower has failed to mention the visit of Mr. Featherstonehugh to the sources of the Mississippi in the year 1835, as described in the "Canoe-Voyage on the Minnay-Sotor." Any approach to the subject of the Mississippi and its sources has been declared by a high British authority to be tiresome; but, even at the risk of renewing an unspeakable weariness, it seems proper to say that Mr. Harrower may have had two good reasons for passing over Mr. Featherstonehugh: one, that the canoe-voyage in question was made by Mr. Featherstonehaugh, and the other, that it had nothing to do with the sources of the Mississippi. It is said in the *Proceedings* that—

"Featherstonehugh spent some time in the district, visiting Lake Travers or Pamidji, which he wrongly thought sent its waters northwards. While wandering about the ridge, or rather plateau, called the Coteau de Prairie, Featherstonehugh looked down upon, but could not approach what, from his map, was evidently Lake Itasca. . . ."

Featherstonehaugh did none of these things. He tells us in the "Canoe-Voyage," vol. 1, p. 378, that on the 3d of October, in the evening, he was one mile from Big

Stone Lake; and on p. 382 he says: "Soon after leaving this place we saw the Coteau du (*sic*) Prairie for the first time on our left, looking very high. . . . The remaining part of our ride was bitterly cold, but a little after 2 P.M. (Oct. 4th) I saw a few scattering trees, which Milor said were growing near Lake Travers; and before three o'clock we reached an edge of the prairie from whence I looked down upon the valley, in which was Lake Travers, with real water in it, being the most southern source of the waters that flow into the Hudson's Bay."

Big Stone Lake and Lake Traverse form part of the western boundary of the State of Minnesota; while the Lake Travers, or Pamidji, of the *Proceedings*, is situated ten miles west of Cass Lake, in northern Minnesota, and 150 miles northeast of the lake described by Featherstonehaugh. This lake does send its waters northward, and their final outlet is through Nelson River into Hudson Bay.

The confusion arising from the identity of name is to be regretted, but students of geography must take facts as they find them. There are in Great Britain three rivers bearing the name of Dee, and the person who undertakes to speak with authority about any one of them is expected to know its position on the map.

IS MT. ST. ELIAS BRITISH?—MR. H. W. Seton Karr, who was with Lieut. Schwatka in the exploration of a part of Alaska in 1886, has declared that Mt. St. Elias stands in British territory. Prof. Davidson shows, in *Kosmos*, No. 2, 1887, that the position of the mountain, according to the Report of the U. S. Coast and Geodetic Survey of 1875 (the latest official authority), is in N. Lat.

60° 20' 45", and W. Lon. 141° 0' 12". In the map published in the A. G. S.'s Bulletin, No. 4, 1886, Prof. Wm. Libbey, Jr., the scientist of the Schwatka expedition, puts Mt. St. Elias exactly on the 141st meridian, the dividing line of British Columbia and Alaska.

Prof. Davidson asserts that Mr. Seton Karr had with him in his expedition no instruments by which he could determine geographical positions. Mr. Seton Karr replies, in *Kosmos*, No. 3, that he had a prismatic compass, lent by the Royal Geographical Society, and a sextant; and he quotes, from the *Coast Pilot of Alaska*, Prof. Davidson's own determination of the mountain's position in Lat. 60° 22' 6", and Lon. 140° 54' 0". The authorities do not seem to agree; but it is to be hoped that in this, as in other questions, the truth may finally prevail, and that the example of the mountain, equally sure of its base, whether on Russian, or British, or American ground, may not be wholly lost upon the men of science.

THE KURO-SIWO.—At a recent meeting of the Geographical Society of the Pacific, Prof. Davidson said that his study of the ocean currents had brought him to the conclusion that a branch of the Japanese warm current, the Kuro-Siwo, does pass into the Arctic Ocean through Behring Strait; and he promised to lay before the Society, at a future time, some information on the subject.

THE NILE AND LAKE IBRAHIM.—It is, or ought to be, well known that, in 1874, Col. C. Chaillé-Long, of the Egyptian Staff, made an exploration of the country from Rubaga, the capital of Uganda, to Urondogani, and thence northwestwardly to M'ruli. Gordon, in a letter

from Massowah, dated Dec. 9, 1879, gives in a few words the results of this expedition: "In 1874 Col. Long, of the Egyptian Staff, passed down the Victoria Nile, from Nyamyongo, where Speke was stopped, to M'rooli, thus, at the risk of his life, settling the question, before unsolved, of the identity of the river above Urondogani with that below M'rooli. He also discovered a lake midway between these places, which he called Lake Ibrahim Those who care to study the successive steps which built up the map of the course of the Nile, will know that to Speke is due the discovery of one portion, to Baker that of another, and to Colonel Long that of another, and of the lake alluded to" (*The Three Prophets*, by Col. C. Chaillé-Long, pp. 46, 47. D. Appleton & Co., New York, 1886.) In Ravenstein's map of Eastern Equatorial Africa, published under the authority of the Royal Geographical Society, Gita Nsige (Lake Ibrahim) is at last laid down as "discovered by Col. Ch. Long, 1874" (or 5, for the last figure is indistinct).

At its N. W. angle Lake Ibrahim on this map is connected by Magogo Pass, only 10 feet wide, with Kioga, or Koja Swamp. Habenicht calls this Kodja Lake, and shows several islands near its E. shore.

Gordon, in the letter quoted, gives Cojé as the native name of the lake called Ibrahim by its discoverer, and expresses the opinion that native names should be preferred. Geographers are inclined to agree with him, and it is to be hoped that the eclipse of the Albert Nyanza, now called, even by the English, Mvután Nsige, may be followed by that of the Victoria Nyanza.

So long as the explorer's right to bestow the name is

recognized, Lake Ibrahim is the name to be given to Gita Nsige.

Mr. Ravenstein has marked the route from Nyamyongo to M'ruli with the names of Gordon and Emin, omitting Long, who preceded them.

This oversight will, no doubt, be corrected in future editions of the map.

THE FOREMOST CHAMPION OF PROGRESS.—M. Didelot, in his Report on the course of historical lectures delivered before the Lyons Geographical Society, remarks very truly that geography has been called the eye of history, and history itself the teacher of humanity. M. Didelot's own school-desk must have been on the blind side of the eminent instructor, for history, properly so called, has had very little to do with the crude and hasty judgments that deform this Report. France, it seems, is the object of suspicion and hatred on the part of foreign governments, and the war of 1870 had no other cause than the jealous and insolent hostility of Germany to the Daughter of 1789, who has always marched at the head of the nations. What Power could take the place of France in guiding the world? Not Italy: she is too young, and has been too long the Land of the Dead. Not England: she is too selfish. In Germany feudalism is too strong, and the government represses every tendency towards liberty. Russia is still savage, Austria too heterogeneous, and Spain is still in subjection to an occult power. As for America, it is a mere business place. There is left France, the foremost champion of progress.

Writing of this kind, superfluous under any circumstances, is singularly out of place in a geographical publi-

cation. It is by no means certain that any one nation has been selected to be the guide, or drum-major, so to speak, of universal humanity; and, if it were certain, it would not prove very much. The greatness of the drum-major is not to be denied, but other dignitaries have also their recognized place.

The work of the world is done, not by declamation, but by energy and sustained effort; and the work of the world is, *pace* M. Didelot, the business, which he dismisses as unworthy of attention. It is only in civilized countries that business, in any large sense of the word, can be said to exist; and with the rewards of business come the development and the elevation of civilization itself, and these constitute progress.

EMIN PASHA.—The *Scottish Geographical Magazine* for June publishes the translation of a paper by Emin Pasha, entitled "An Exploring Trip to Lake Albert."

There is no date to the paper, but the original was received by Dr. R. W. Felkin on the 9th of May.

The trip was not a long one. Emin steamed as far as an island below Mahagi on the W. coast, and thence across the lake to Kibiro, and returned along the E. coast to Wadelai, from which he had started. The western hills range from 1,310 to 1,640 feet in height. They are thinly forested and seamed with water-courses, and in places there are thickets of bamboo.

Behind Mahagi the hills sink, and the more distant, elevated range, called the Mountains of Lendu, comes into view. Emin inclines to believe that the foreshore on the west is gradually encroaching upon the waters.

The hills on the eastern side resemble those on the

western. The geological formation is the same, and the descent to the lake on each side is by terraces.

There is no cultivated land at Kibiro; "not even a square inch." The bay abounds with fish, which the natives dry and sell in all the region about the lake; but the chief industry is the production of salt, with which Kibiro supplies the northern parts of Unyoro, and most of Uganda, the Lur country and the Shuli. The salt-works are at the foot of the mountain-chain behind Kibiro, where hot springs bubble out in a ravine. These springs have in several places a temperature of 185° to 195° Fahr. The salt is made by filtration from the saline earth.

At Kibiro Emin received letters; one from Dr. Junker, an official communication from Nubar Pasha, a greeting from Titi, formerly secretary to Mtesa, and a very friendly letter from the Sultan of Zanzibar.

In his letter to Dr. Felkin, Emin speaks of two later excursions to the lake, and the discovery of two large rivers which enter it on the south.

This paper and the portion of Emin's letter, published as they are, without date, leave on the mind of the reader an impression that the beleaguered pioneer of civilization in Central Africa is doing, on the whole, very much as he pleases. It is true that a geographical note, thirty pages farther on in the *Magazine*, explains that the letter quoted bears date at Wadelai, Oct. 26, 1886, and was written after the paper which it enclosed; but it was an error of judgment not to state these facts at the outset. The break between the paper and the note is absolute, and for one who will take the trouble to find the connection between them there will be many inclined to doubt whether the call upon their sympathies has not been unnecessarily loud.

LAKE MOERIS.—M. Maspero, one of the very few persons who can speak with fulness of knowledge on Egyptian subjects, says in his just-published work, "*L'Archéologie Egyptienne*":

"I no longer believe in the existence of Moeris. If Herodotus ever visited the Fayoom, it must have been in summer at the time of the high Nile, when the whole country presents the aspect of an actual sea. He took the embankments, which divided the basins and served as roadways between one town and another, for the banks of a lake. His story, repeated by the old writers, has been accepted by our contemporaries; and *Egypt*, neither accepting nor rejecting it, has been flattered long after date by the reputation of a gigantic work, the execution of which would have been the glory of her engineers, had it ever existed."

Miss Edwards, the English translator of M. Maspero's book, is so little satisfied with the rendering of the italicized passage, that she appends the original: "*et l'Egypte, qui n'en pouvait mais, a été gratifiée après coup d'une œuvre gigantesque. . .*" This seems to mean: "And Egypt, which was not responsible for it, received from later ages the credit for a gigantic work," etc.

There are some who do not agree with M. Maspero, and among them is M. Reclus.

Mr. F. Cope Whitehouse's plan for filling what he considers to be the ancient bed of Lake Moeris was discussed on the 6th of May by the Egyptian Institute. The proposed lake, it was objected, would have an extent of 200 square kilometres, and this it would not be possible to fill in a country where evaporation was so rapid and so great as in Lower Egypt. Mr. Whitehouse replied that

the lake would cover but half the surface named, and that the main supply of water would be taken directly from the Nile, while the Bahr Yusuf would be drawn upon every year for an additional volume. The Bahr Yusuf being itself a canal drawn from the Nile, the additional resource offered by its waters would seem to be largely a matter of illusion, or Egyptian mirage; but Mr. Whitehouse affirms that his plan is approved by distinguished engineers.

THE PANAMA CANAL.—Mr. R. Nelson Boyd, an English engineer, delivered in March last, before the Civil and Mechanical Engineers' Society, London, a lecture on the Panama Canal. Mr. Boyd showed that work had been commenced all along the line, but that not one section was any thing like near completion. Not one of the cuttings is down to water level. The work at Culebra requires the moving of 20,000,000 cubic metres, and but $\frac{1}{20}$ of this task has been finished. To complete it will require six years. "The waste in machinery accumulated along the line," says Mr. Boyd, "is something abominable. I have seen a dozen locomotives, apparently in good order, shunted on sidings, and left to rust away, with green leaves growing out of fire-doors and funnels."

The total cube of the canal Mr. Boyd estimates at 150,000,000 cubic metres, of which 120,000,000 remain to be extracted. To do this will require ten years, and the money needed is not less than 2,200,000,000 francs. The capital eventually invested will be over 3,000,000,000 francs. "The impression made on me," says Mr. Boyd, in conclusion, "was a sad one. The glory won at Suez is to be lost at Panama."

M. Boulangé, a French engineer, just from Panama, gave a lecture before the American Society of Civil Engineers in this city on the 16th of June.

"Even at this late day," he said, "there is not a first-class map or profile of the canal." Not more than one-fifth of the work has been done, and this has cost 900,000,000 francs. The great cut (Culebra) of 318 feet has been dug to 38 feet. It is a fact that there are landslides on the line. Sixty per cent. of the laborers perish, and eighty per cent. of the whites. Last year seventy-two engineers, agents, clerks, etc., went out to Panama, and eleven are left fit for work; forty-five are dead, and the others as good as dead.

The money on hand will last, M. Boulangé thinks, for four months, after which the enterprise must be given up permanently, or, at least, for some years.

M. E. Philippon, who signs himself "Actionnaire du Suez depuis 28 ans, 127 Avenue Malakoff," issued in Paris in May a letter to the stockholders of the Suez and Panama canals.

He shows, from the *Bulletin* of the Panama Company, that repeated promises were made that the whole cost of the work, including interest, should come within 600,000,000 francs, and yet in 1885 a cost of 1,070,000,000 was admitted, and M. de Lesseps asked the French Government to authorize an additional loan of 600,000,000 francs.

The annual expenses of 86,000,000 will be increased by the next loan to over 100,000,000 francs.

The monthly extraction of 1,000,000 cubic metres was to be increased to 3,000,000 in 1887. It goes on as before. The Gamboa dam, in 1883, would cost 8,000,000. In 1885

it was to cost 40,000,000, and then 100,000,000. In 1886 it was the greatest technical difficulty in the way. In June, 1886, some expedient was to be found to turn the dam, and "Now," says M. Philipon, "readers, what do you think of the dam?"

M. Philipon quotes from the *Bulletin* of August 1, 1885, the engagement of the contractors to deliver the canal open for the passage of ships through the mass of the Culebra on the 1st July, 1889; 610,000 cubic metres were to be removed each month from January, 1886, to July, 1887. In reality, the mass extracted in the twelve months of 1886 was 608,000 cubic metres, and there are 23,000,000 to be moved.

The concession to the company expires in 1892, and the canal, if unfinished at that time, becomes the property of Colombia, and her rights, says M. Philipon, will be energetically supported by the United States, and probably by England.

There is no royal road to success in engineering, any more than in learning, and the enterprise at Panama has come to ruin because it was undertaken and has been conducted in open defiance of sound principles.

THE BASSENGÉ.—These people, who dwell in the region between the Kassai river and its great affluent on the right, the Ikatta, are described by Lieut. Kund, of the German expedition, as negroes of a type previously unknown:

"They were tall in stature, with a singularly small body and long legs. Their hair, which was parted in the middle, was gathered into long braids and twisted round the chin and the neck. In the expression of the

face they were utterly unlike the negroes we had seen, and displayed types such as we find in Europe among those whose lives have been devoted to intense intellectual labor. The foreheads were high and the features full of intelligence. I remarked to Tappenbeck that if these men were white and lived in one of our large cities, they would be taken for scientists or for members of Parliament. There were hardly any stupid faces among them, but several had a wicked and devilish expression not to be found among us. I remember particularly one face that made me say: 'That fellow is the very picture of Mephistopheles.'

The members of Parliament and the scientists can take their choice.

TITLES OF PAPERS IN GEOGRAPHICAL JOURNALS.

AMSTERDAM.—*Revue Coloniale Internationale*.*

The Weekly Market on the Congo—* Colonial and Indian Exhibition—Straight- and Curly-Haired Races between Celebes and Papua—Germany's Protectorates and Colonial Enterprises at the Beginning of 1887—* A Word on the Practice of Saccharometry—Impressions of Scenery on the Congo—France in Northern Africa—The Republics of Spanish America—On the Hair-Sacrifice and Other Mourning Customs in Indonesia—Colonization of Madagascar—French Colonies and Protectorates—* Tabular View of the Private Estates in the Dominions of Deli, Langkat, and Serdang (E. Coast of Sumatra).

* Articles marked with the * are in English.

BERLIN.—*Deutsche Kolonialzeitung.*

France and the German E. African Society's Interest in the Comoro Islands—The Political Grouping of South Africa—Portuguese West Africa—The Colonization Question in Mexico—England's Renunciation of Port Hamilton—Distribution of Rain in Southern Brazil—Organization of Emigration—The First Steamer on the Camaquam (Rio Grande do Sul)—German Vitu-Land—German Colonies and Colonial Enterprises in Paraguay, Rio Grande do Sul, and São Paulo—The Greatest Steamship Companies of the World—Ethnography of Madagascar.

Zeitschrift der Gesellschaft für Erdkunde.

Remarks on the Map of the Boundary between Venezuela and Brazil—History of the Discovery and Conquest of Chile—Topography of Crocodilopolis-Arsinoë—Remarks on the Spanish Statements as to the Area of the Philippine Native Dialects—The Russian Survey to the End of 1885—Land and People in the Southern States of North America—Statistics of Costa Rica.

Verhandlungen der Gesellschaft für Erdkunde.

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ROSSELL DWIGHT HITCHCOCK, D.D., LL.D.

BORN AT EAST MACHIAS, MAINE, AUGUST 15, 1817.
DIED AT FALL RIVER, MASSACHUSETTS, JUNE 16, 1887.

By the sudden death of the Rev. Dr. Hitchcock, New York has lost one of her best citizens. His special work had for a generation been that of a theological teacher, and to this was added, for the last seven years, a responsible and engrossing office of administration in the institution to which, in the professor's chair, his services had long been given. But he was widely known outside of the walls of the Union Seminary. He had fame as a preacher; he was sought as a platform orator; he could be counted on as an uncompromising and ardent patriot; he graced every social gathering for which his absorbing duties allowed him time and strength; he exerted a distinct personal influence in the community as an earnest, accomplished Christian gentleman.

In each function he excelled not only by reason of the special gift necessary to each, but also by virtue of his broad sympathies and his large manhood. All public affairs had interest to him. His marked concern in social questions, his conscientious discharge of political duties, his steady, fresh zeal for whatever promised to increase the sum of human knowledge,—all illustrate the quality

of his citizenship. He was a scholar without being a recluse. His care for sound learning and for progress was not theoretical or impersonal. It was one of the forms of his loyalty, represented his sense of the dignity of man, stood for a claim upon the divine inheritance of true knowledge and wisdom, and was constantly guided and tempered by his unswerving moral and religious conviction, and by his genuine regard for his brethren. His human feelings were keen and quick. This appeared in the warmth of his friendships and the geniality of his home-life; it appeared in his intercourse with his students, in his pulpit-services, where he used doctrine to make character; and it appeared as well in the lively response of his heart to all that stirs men. There was a delicate appreciation in his soul of what was fine and beautiful, and a heroic fire that promptly answered to heroism,—whether shown by soldiers marching to the seat of war or by intrepid explorers who braved the cruel North. Besides this, he could communicate something of his emotion to others without losing his self-command,—a few clear-cut, ringing sentences compelled the attention and the feeling of his listeners. No one who saw and heard him when Greely came home,—or when DeLong was brought home,—will soon forget it.

He was so true a citizen, so strong and good a man, that his death is a public bereavement. We may take some comfort from the thought that he did what in him lay to perpetuate among us the qualities and forces that made his life the fruitful thing it was. But the first strong impulse is to lament not merely the personal loss,

but also the impoverishment that befalls a city, or a land, when such men vanish out of it.

At a meeting of the Council of the American Geographical Society held at the Society's rooms, 11 W. 29th St., June 20, 1887, the following resolutions were unanimously adopted :

Resolved, That, in common with all who had the privilege of knowing him, we have learned with profound sorrow of the death of our distinguished associate, the Rev. Dr. Roswell D. Hitchcock, for many years a Vice-President of this Society.

Resolved, That we recognize the deep interest he took in this Society, and his readiness always to labor for its welfare ; that it was chiefly through his exertions that the survey of the eastern and comparatively unknown portion of Palestine was planned and carried out ; that when we consider his extensive and varied learning, his aptitude as an instructor, his rare gifts as an orator ; the interest he took in public affairs, the influence he exercised over them, the inestimable value of his services in this city in aid of the struggle for the preservation of the Union ; his broad and catholic views as a thinker, his wide toleration, his firm and unyielding adherence to his conviction of the right, and the gentleness of his manner ; we feel not only that this Society has lost one of its brightest ornaments, but the community in which he lived a great citizen.

Resolved, That a Committee of Three, to consist of the President, Charles P. Daly, and two Vice-Presidents, Gen. Geo. W. Cullum and Francis A. Stout, Esq., be requested to attend the funeral services at Fall River on Tuesday, June 21, 1887.

Resolved, That the President be requested to prepare a memorial of Dr. Hitchcock, to be read at the next meeting of the Society, and that a copy of these resolutions be transmitted to the family of the deceased.

EGBERT L. VIELE,
Secretary.



